



Joint Land Use Study Implementation – Phase III – Microtransit Pilot Service Design

Southern Maine Planning & Development Commission

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Joint Land Use Study Implementation Phase III

Microtransit Pilot Service Design



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AECOM Technical Services, Inc.

Cover page photo taken by Portsmouth Naval Shipyard. Photo depicts PNS workers boarding internal shuttle bus vehicle. In the selected alternative, workers would get out of the microtransit vehicle in front of Gate 1, use the pedestrian turnstiles to scan their identification and then would have the option to board the internal shuttle bus to get to their work sites.

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Acronyms and Abbreviations

ADA	Americans with Disabilities Act
BIL	Bipartisan Infrastructure Law
BSOOB	Biddeford Saco Old Orchard Beach Transit
COAST	Cooperative Alliance for Seacoast Transportation
DMP	Data Management Plan
DOD	Department of Defense
DOT	Department of Transportation
EAP	Equity and Accessibility Plan
FTA	Federal Transit Administration
JLUS	Joint Land Use Study
KITT	Kennebunk In Town Transportation
KPI	Key Performance Indicators
NTD	National Transit Database
PNS	Portsmouth Naval Shipyard
ROW	Right-of-way
SaaS	Software-as-a-Service
SMPDC	Southern Maine Planning and Development Commission
TaaS	Transportation-as-a-Service
TIP	Transportation Incentive Program
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children
YCCAC	York County Community Action Corporation

Executive Summary

This Microtransit Pilot Service Design stems from a Joint Land Use Study (JLUS) that the Town of Kittery, Portsmouth Naval Shipyard (PNS) and the Southern Maine Planning & Development Commission (SMPDC) initiated in 2019. A JLUS is a collaborative effort that helps communities and adjacent military installations to plan for compatible development and identify and address issues that are problematic for one or both parties. The initial JLUS Final Report was completed in January 2020. The Final Report documents PNS-related traffic congestion having a large impact on Kittery and the shipyard itself. It documented several contributing factors:

- PNS is on an island connected to Kittery via two bridges.
- Everyone who enters must queue in a security checkpoint.
- While there are multiple shift times for PNS workers, most workers have a 6:30am-2:30pm shift, meaning that PNS-related commute traffic is concentrated beforehand and afterward
- Many PNS workers come from far away given that they largely cannot afford to live in Kittery or other adjacent communities.

WHAT IS MICROTRANSIT?

Microtransit is an Uber-like transportation service which picks up passengers at their doorstep or at a nearby location and takes them to where they need to go. A person who wants a ride books one through an app (or by calling a specified phone number). With microtransit, multiple riders are picked up on the way to common (or close by) destinations.

In the subsequent Implementation Plan, completed in 2022, the study team recommended developing a microtransit pilot from Sanford to PNS as an alternative to private automobile commuting because of the large number of PNS workers that live there. This report—part of JLUS Implementation Phase III—serves to document the approach, objectives, and design of this pilot service.



Source: Norwalk Transit District Wheels2U Microtransit Service

Microtransit Defined

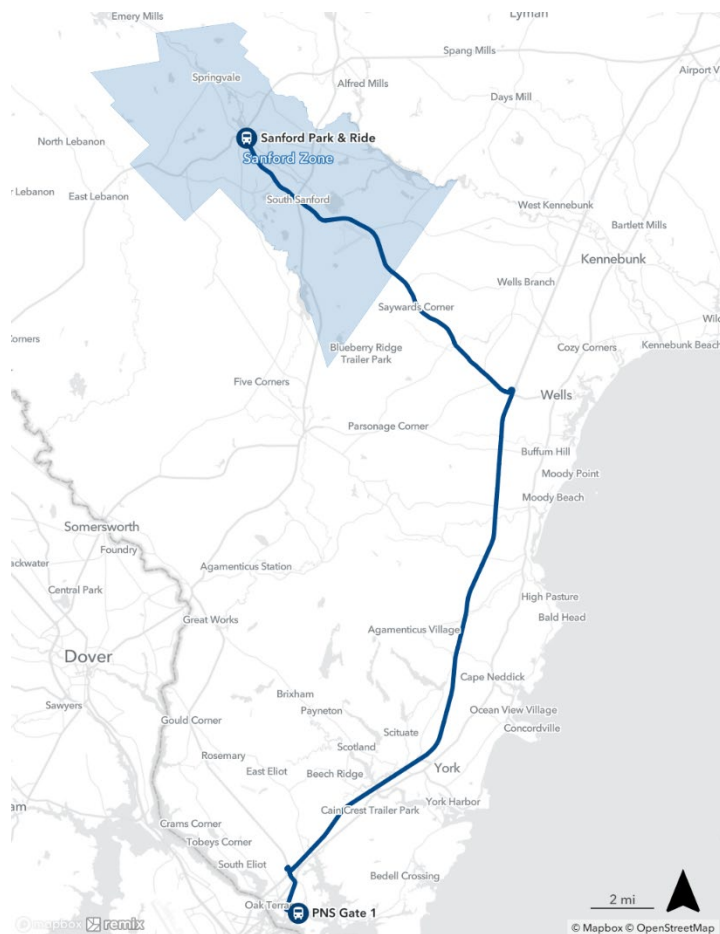
The 2022 JLUS Implementation Plan identified microtransit as a potential solution to the transportation challenges identified in the 2020 JLUS study. Microtransit is an on-demand Uber-like transit service with flexible routing based on real-time trip demand and origin-destination patterns. Microtransit service is typically built on a few key assumptions: app or web-based, dynamic trip booking and planning, and eligible pick up/drop off zones. Riders schedule trips by requesting a pickup either on an agency-hosted or third-party app and inputting their desired destination. Both the pickup location and drop off location must be located within an eligible service zone. However, an agency may designate specific pick up and drop off points outside of a zone such as at a major employer. Once the trip is booked, the trip planning software will determine a route for the operator to follow in completing scheduled trips. Wait times can vary greatly for microtransit service and are generally a function of service area size, rider demand, and number of vehicles (and drivers) available.

Microtransit Pilot Service Design

Three initial service designs were presented to the project's stakeholders serving on the Microtransit Subcommittee. The three options were:

- A microtransit zone-based option,
- A mobility hub-based option; and
- A regular fixed route-based option.

Subcommittee participants provided feedback on the initial designs presented and this feedback was used to create the final hybrid service design. This option combines the flexibility of microtransit service with the efficiency of mobility hub-based/express service. In this option, transit vehicles begin service with a “microtransit service window” whereby operators complete pre-booked pickups in a 30-minute window within the service zone defined as the Sanford municipal limits before stopping at the central Sanford park and ride hub. Then vehicles travel to PNS via express service directly to PNS Gate 1 for drop off. Afternoon service would operate in reverse. Riders who booked microtransit drop offs would then be dropped off at virtual stops in the microtransit window.



Future Phases and Additional Options

Additional mobility hubs would allow for service expansion in future phases. As part of Phase III work, concept site plans for two mobility hubs located in Kittery were created, which would provide opportunities for regional connections and additional microtransit zones based in the Kittery area. Future phases could also expand service to other local MaineDOT park and ride lots, the Wells Transit Center, and other locations, reinforcing regional connections and serving additional demand.

As this pilot design has been developed, YCCAC and SMPDC have engaged with representatives from the Puget Sound Naval Shipyard to discuss their extensive transit service for commuters. Puget Sound Naval Shipyard partners with Kitsap Transit to maintain a worker-driver program as a transit option for local shipyard workers. In this program, shipyard workers are employed in a part-time capacity by the transit agency to operate transit vehicles on routes to pick up and drop off workers. These vehicles are also able to drive onto the shipyard as operators are deputized to complete the necessary security checks of shipyard worker identification badges. YCCAC is interested in implementing a similar program for PNS workers. This would solve two hurdles for YCCAC—hiring the additional operators needed to implement service and providing service two hours earlier in the day than is currently offered.

Also being discussed at the time of the drafting of this report is an express bus service that would connect Biddeford and Saco to Kittery and PNS. This service would be operated by Biddeford Saco Old Orchard Beach (BSOOB) Transit.

1. Introduction

This microtransit pilot implementation plan has been developed for use by the York County Community Action Corporation (YCCAC) in partnership with Southern Maine Planning and Development Commission (SMPDC), Portsmouth Naval Shipyard (PNS), the Town of Kittery, and other stakeholders.

1.1 Purpose and Objectives

The Portsmouth Naval Shipyard (PNS) is located on Seavey Island in southeastern Maine between the Town of Kittery, Maine and the City of Portsmouth, New Hampshire. The island can be accessed by two checkpoint gates (Gate 1 and Gate 2). In total, PNS employs approximately 8,400 workers including about 125 contractors.

PNS workers largely commute to the island by car, either by private vehicle or in privately organized commuter vanpools and buses. The island hosts a limited amount of parking and faces congestion issues as thousands of workers begin and end shifts at the same time through limited access points. The purpose of this study is to present a microtransit pilot designed to alleviate congestion both on the yard and within Kittery by offering another alternative to vanpools that offers flexibility and reduces parking demand.

1.2 Previous JLUS Planning Efforts

SMPDC led a Joint Land Use Study (JLUS) in 2020, with the Town of Kittery and PNS, to understand current issues facing the shipyard and surrounding communities. This study was financed by the Department of Defense Office of Local Defense Community Cooperation (OLDCC). The JLUS study area included all land in the vicinity of the shipyard, including the surrounding communities identified to participate in the study. This study involved many active partners including representatives from PNS, MaineDOT, COAST, and YCCAC. Local government and regional planning organizations were also involved in the study including representatives from the communities included in the study:

- Kittery
- York
- Wells
- Eliot
- Sanford
- Portsmouth

In 2022, SMPDC, the Town of Kittery, and other partners produced the Implementation Plan to guide implementation of recommended solutions identified in the 2020 JLUS. The Implementation Plan includes three main tasks:

- Transit Corridor Feasibility Study
- Multimodal Hub Feasibility Study
- Housing Affordability Analysis and Toolkit

1.3 JLUS Phase III

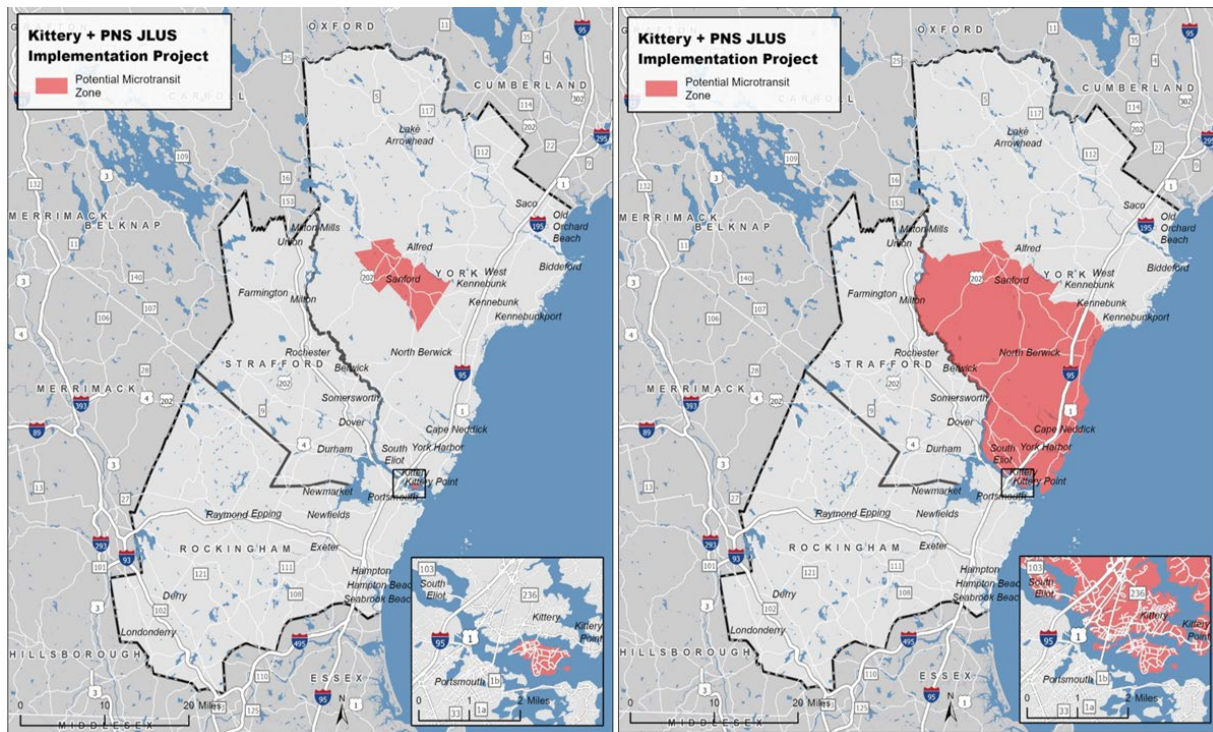
In 2022, SMPDC received an additional OLDCC grant to continue its partnership with the Town of Kittery and PNS to lead the implementation of recommendations principally around the themes of transportation and housing (JLUS Implementation Phase III). This report is part of the Phase III work and focused on the first task of developing a transit solution for PNS commuters. Previous findings point to gaps in the transit system as a reason for vanpool popularity in the region. As described in the Implementation Plan, while vanpools are a solution to the lack of regular transit service, their schedules may also create issues for workers as vanpools have one departure time and one return time each day. If a person's schedule differs on a particular day, another

method of transportation must be found. Furthermore, when employees' shifts change, they must find another vanpool that accommodates their new schedule.

The Implementation Plan proposes commuter, microtransit, or other flexible service as potential solutions. Microtransit, in particular, was identified as a way to provide service in those areas where transit gaps exist. Microtransit could increase service coverage and reduce wait times.

The Implementation Plan identified YCCAC as the microtransit service operator because the agency services the area targeted for the microtransit service pilot (York County). The Plan maps five potential service zones ranging from Sanford/Springdale to include the entire York County. Two of these potential zones are shown below in Figure 1-1.

Figure 1-1: Potential Microtransit Zones



Source: JLUS Implementation Plan 2022

The Implementation Plan selected the Town of Sanford boundary for a microtransit pilot because of the high number of PNS workers who live in Sanford. Therefore, from the onset, for this Phase III task, the Study Team has examined various options from Sanford to PNS.

















1.4 Microtransit Overview



As described in the Implementation Plan, microtransit service differs from fixed-route scheduled service and has the potential to be a lower-cost way to expand transit service coverage, particularly in low-density areas.

Microtransit is a technology-enabled public transportation system with flexible routing based on real-time trip demand and origin-destination patterns. Microtransit service is typically built on a few key assumptions: app or web-based trip booking and planning and eligible pick up/drop off zones. Riders typically schedule trips by requesting a pickup either on an agency-hosted or third party app and inputting their desired destination (or by using a call-in option, if they do not have a smart phone). Both the pickup location and drop off location must be located within an eligible service zone. However, an agency may designate specific pick up and drop off points outside of a zone such as at a major employer. Once the trip is booked, the agency's trip planning software will determine a route for the operator to follow in completing scheduled trips. Wait times can vary greatly for microtransit service and are generally a function of service area size, rider demand, and number of vehicles (and drivers) available.

Transit agencies have many options for implementing microtransit service according to their capacity and preferences. Microtransit implementation is discussed in terms of who is providing the microtransit service (transit agency or vendor) and is generally categorized according to two primary service models: Software-as-a-Service (SaaS) or Transportation-as-a-Service (TaaS). Figure 1-2 identifies the microtransit service elements typically provided by the transit agency or vendor according to the SaaS and TaaS service models.

Figure 1-2: SaaS and TaaS Comparison

Microtransit Service Element	Software as a Service	Transportation as a Service (Turnkey)
Service Design and Public Engagement		
Vehicle Sourcing (leasing or purchasing)		
Hiring and Training Drivers		
Rider Smartphone Application		
Web Portal		
Driver Smartphone Application		
Call Center / Dispatch		
Managing Service Operations		

 Resource provided by Transit Agency
 Resource provided by microtransit vendor

In the SaaS model, agencies provide microtransit service by purchasing proprietary software from a third-party vendor. The agency is then responsible for providing operations management, operators, and vehicles. At a minimum, it is recommended that a microtransit platform include dynamic vehicle routing capacity, passenger aggregation, rider and operator apps, booking support, backend administrative tools, and ongoing agency support for technical, operational, and marketing issues.

In the TaaS model, agencies contract with a microtransit vendor who provides a turnkey solution. This turnkey option includes the microtransit technology, as well as the necessary operators, vehicles, and operations management. However, it is important to note that options for implementation exist along a continuum with transit agencies having the flexibility to choose which service aspects are performed in-house versus contracted out. For example, an agency with available vehicles but limited staff may choose a hybrid of SaaS and TaaS where they use their vehicles to deploy microtransit service but contract with a vendor for drivers. It is important to note that an agency can perform the needed functions for implementation using in-house staff, by hiring a consultant, or by building the functions into the provider contract. Figure 1-3 summarizes the general benefits and challenges associated with SaaS and TaaS service models for agencies.

Figure 1-3: SaaS and TaaS Benefits and Challenges



1.5 Overview of YCCAC

YCCAC provides a variety of community services in the Sanford area in York County, Maine. This includes providing transportation service for the approximately 200,000 residents in the service area. YCCAC also supports other transportation programs such as the “Connecting to Cancer Care” program, Veterans transportation, and a volunteer driver program.

1.5.1 Existing Transit Service

YCCAC offers a variety of flex routes, including seasonal routes, Monday through Friday generally between 8 AM and 4 PM. Sanford Transit is YCCAC’s year-round scheduled bus service in Sanford and Springvale. The Orange 5 line connects Sanford and Wells and serves popular destinations such as the Wells Regional Transportation Center and the Sanford Regional Airport. The Orange 5 is currently fare-free and offers several sites for free parking to access service. The Southern Main Connector route runs between Sanford/Springdale and the Saco Transportation Center with connections to the Amtrak Downeaster and the Biddeford Saco Old Orchard Beach Transit (BSOOB) service network. YCCAC also operates a seasonal trolley and shuttle route

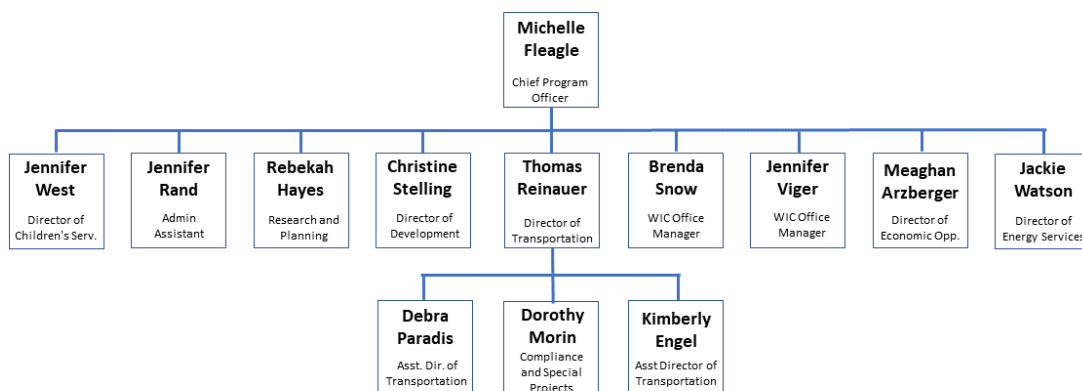
along the coast between York and Kennebunk. The Kennebunk In Town Transportation (KITI) service operates only on Tuesdays between 10 AM and 4 PM.

YCCAC also operates several demand response transportation services throughout York County. The WAVE is a workforce transportation service within Sanford, between Sanford and Biddeford, and between Sanford and Wells. It operates seven days a week from 6 AM to 11:30 PM, providing rides for thousands of residents each year to access education, job training and employment. Reservations for demand responses must be made at least 48 hours in advance and route deviations must be requested 24 hours in advance. YCCAC also operates weekly shopping buses where residents are able to make reservations for trips to and from grocery shopping once a week. MaineCare members are also eligible for YCCAC trips to medical appointments through ModivCare and are completed by volunteer drivers in agency buses/vans. Similarly, Medicare recipients are eligible for the Access2Care program which contracts with YCCAC to provide transportation for medical appointments. YCCAC provides transportation to medical and related appointments for any York County resident, regardless of income level, who is not a MaineCare member.

1.5.2 Administration and Staff

YCCAC currently has approximately 35 staff members, including 25 operators and 10 office staff. YCCAC administers a number of programs beyond transportation, including a Special Supplemental Nutrition Program for Women, Infants, and Children (commonly known as WIC) and housing support. Key members of the YCCAC staff are represented in Figure 1-4.

Figure 1-4: YCCAC Organization Chart



Source: YCCAC

1.5.3 Vehicle Fleet

YCCAC's current vehicle fleet includes 21 light transit vehicles, 3 passenger vans, and 6 trolleys. Fleet vehicles are Americans with Disabilities Act (ADA) accessible and range from 5 seats to 24 seats with space for 2 wheelchair passengers in each vehicle. YCCAC is partnering with MaineDOT to expand its fleet of small buses and large passenger vans and has completed a vehicle ranking report to identify vehicles for replacement.

1.5.4 Technology

YCCAC uses Remix software for service planning. Remix is a transportation planning software that allows agencies to import routes and schedules or plan new lines on the map. Remix has fixed-route and microtransit service tools to develop and edit current or planned service. Additionally, the agency uses Android-based tablets onboard vehicles for operators. YCCAC currently uses Easy Rides software for scheduling trips and sharing trip information on driver tablets.

2. PNS Workforce Transportation Needs

Transportation to PNS is challenging for workers in several ways. One main reason is that PNS is on an island with only two access points and gates that require a security check every time anyone enters. Additionally, the towns around the Shipyard have had skyrocketing housing costs in recent years, leading many PNS workers to live further inland where housing may be less expensive.

2.1 Existing Transportation Options

This chapter outlines these current transportation options and establishes challenges PNS workers face for commuting to the shipyard. PNS workers currently have several options for commute mode such as vanpools, carpools, buses, walking, biking, driving or a combination of these. Workers residing within COAST's transit service area in the seacoast New Hampshire area are also able to access transit for commuting. Many PNS workers participate in the US Navy's Transportation Incentive Program (TIP) and commute to their shifts in organized private vanpools or use one of the modes described above.

Figure 2-1 COAST Transit Vehicle traveling from Portsmouth to Kittery



Source: coastbus.org

2.1.1 TIP Program

The US Navy's TIP is designed to reduce federal workers' contribution to pollution and congestion by offering reimbursement for mass transit and rideshare commuting costs. All Navy and Marine Corps active duty personnel and civilian employees are eligible for the program. TIP participants must sign up for the program and have their commute approved by their supervisor and representative (Reviewing Official) from their local TIP office.

The TIP program includes commute requirements regarding the number of days ride share or mass transit is used as well as the percentage of the total distance of the commute taking place via ride share or mass transit. Participants must document and submit proof of participation (for example, through vanpool attendance sheets).

Participants are then given a debit card to receive their benefits electronically as long as they are enrolled in the program.

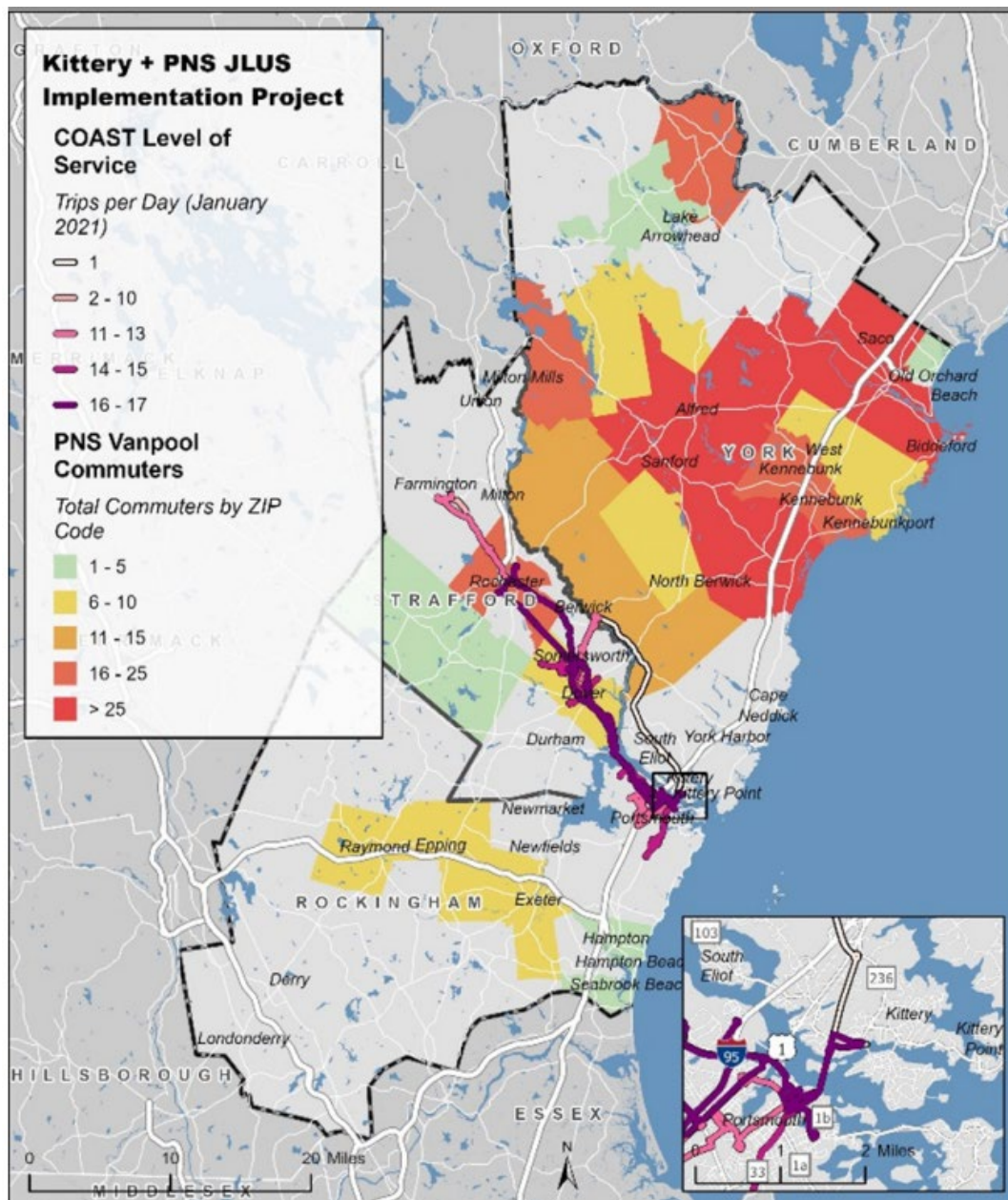
2.1.2 Vanpools and Commercial Buses

Many PNS workers currently take advantage of organized vanpools or commercial bus services. Vanpools are typically comprised of 10 riders (although they range in size from 3-15 passengers) and are organized based on the home locations of interested workers and provide the benefit of reducing commuting costs and avoid parking on site. While there has been some reduction in private vanpool participation because of the COVID pandemic, participation remains quite high. Nearly 500 employees are currently using vanpools to commute to and from PNS.

A number of private and commercial buses also offer commuter service to PNS. These buses are either cutaway or full sized bus vehicles with 12-36 seat capacities. The drivers maintain commercial driver's licenses (CDLs) and are operated by private companies.

The most common shift time for vanpool passengers is 7:00 AM to 3:30 PM, following by 6:00 AM to 3:30 PM. Shift times prior to 6:00 AM are relatively uncommon. Figure 2-2 maps the locations of vanpool participants as well as 2021 trips on COAST transit routes. As shown in the figure, many vanpool participants live in the central-east portion of York County (outside the COAST service area).

Figure 2-2: PNS Vanpool Participants



Source: JLUS Implementation Plan 2022

2.1.3 COAST

COAST provides service to seacoast New Hampshire and Berwick, South Berwick, Eliot, and Kittery in southern Maine with nine local routes and four regional routes. One regional route, Route 100, serves PNS Gate 1. Route 100 runs from the Tri-City Plaza on High Street in Somersworth, New Hampshire to connections in Berwick, South Berwick, and Eliot, Maine, before terminating at the PNS Gate in Kittery. As of the published September 2022 schedule, Route 100 operates once a day, Monday through Friday in each direction. The bus departs Tri-City Plaza at 5:20 AM and reaches PNS by 6:03 AM. In the afternoon, the bus departs from Gate 1 at 3:15 PM and returns to Tri-City Plaza at 4:07 PM.






Local COAST Route 44 also serves PNS Gate 1. Route 44 is a relatively short local route that connects Hanover Station and Portsmouth City Hall across the river to PNS. Service operates hourly Monday through Friday. Hanover Station provides connections to six other local routes that serve Dover, Portsmouth, and other seacoast New Hampshire communities near the Shipyard.

The base cash fare for COAST riders is \$1.50 or \$0.75 for Half Fare (65+, Disabled, Medicare). A monthly pass costs \$52 for unlimited rides.

2.2 Transportation Challenges

PNS workers face transportation challenges arising from a number of factors including the lack of public transit options for workers in Southern Maine to reach Kittery, early shift times, restricted access points, limited island parking, and lack of affordable housing proximate to the Shipyard (Figure 2-3). COAST provides service to Gate 1 from New Hampshire but does not serve residents in southern York County. Vanpooling is a popular alternative to transit or driving alone, particularly for residents in Sanford, Saco, North Berwick, and Kennebunk (Figure 2-2). However, vanpooling brings its own challenges. Vanpool vehicles make one trip in each direction per day. In the event that a participant must deviate from their regular schedule, they must arrange alternative transportation for the day. Furthermore, if employees' shifts change, they must find another vanpool that accommodates their new schedule. Additionally, while vanpools reduce the number of vehicles parked on the base, public transit reduces parking demand even further. This would allow the Shipyard to continue to grow without placing additional strain on the on-base roads or on-site parking.

Figure 2-3: Transportation Challenges

	Limited parking at PNS (5,000 spaces vs. 7,000 commuters)
	Access restricted to two gates
	Convenience and availability of fixed-route transit service
	Low-density development patterns
	Long commute distances from dispersed locations

2.3 Shift Time Analysis of PNS Workers

This pilot development also included an analysis of shift times for PNS workers. The results show a majority of the PNS workforce scheduled between 6:00 AM and 3:00 PM. Table 2-1 shows the most common shift times for PNS workers. Over 2,000 workers have shift start times of 6:00 AM and another 2,000 workers begin at 6:30 AM. While PNS has shift times later than 7:00 AM, these shifts are significantly less common.

Table 2-1 Most Common PNS Worker Shift Times

Shift Start	Shift End	Number of Workers
6:00 AM	2:30 PM	1,580
6:00 AM	3:30 PM	236
6:00 AM	4:30 PM	352
6:30 AM	3:00 PM	2,053
7:00 AM	3:30 PM	612
3:00 PM	11:30 PM	549

This suggests that serving a 6:00 AM start time will likely result in the highest ridership and greatest utility to PNS workers. Likewise, targeting a 3:00 PM afternoon service start would be most used by PNS workers returning home at the end of their shifts. Understanding the most common shift times is key to anticipating the greatest demand for transit service and for addressing parking challenges on the Shipyard.

Figure 2-4: Current Parking Facilities on PNS

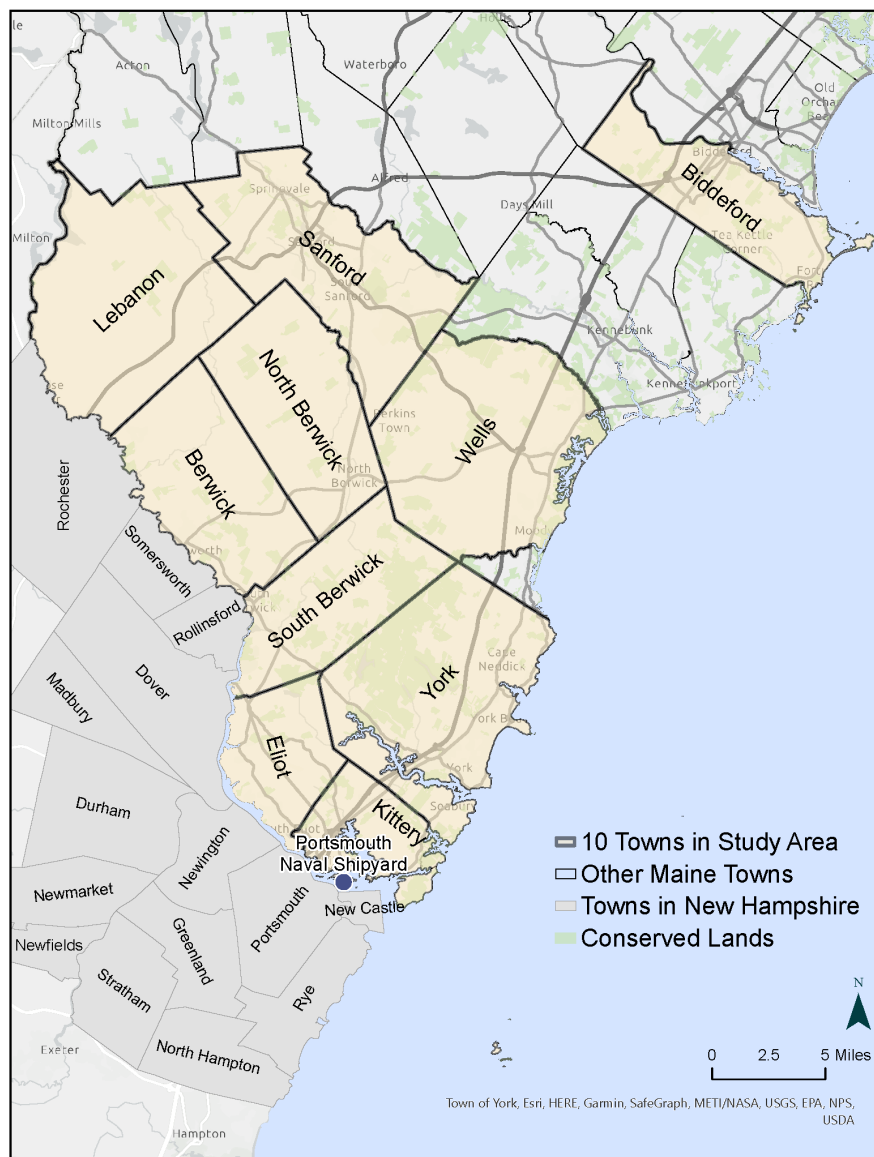


Source: Portsmouth Naval Shipyard

2.4 Spatial Analysis of Worker Origins

This section describes a spatial analysis of PNS worker origins. The results of this analysis demonstrate a high concentration of workers originating in Sanford, Maine (499). This is closely followed by Kittery, Maine (438) and Berwick, Maine (437) (Figure 2-5). This spatial analysis reinforces the selection of Sanford, Maine for the first phase of microtransit service implementation.

Figure 2-5: Shipyard Worker Origins



Source: Housing Needs Assessment, AECOM

3. Alternatives Analysis

This chapter details the microtransit alternatives analysis process. The transportation challenges (such as limited parking and restricted access) described previously were influential in guiding the development of the alternatives presented here. Firstly, the location of potential microtransit zones was considered. Prior JLUS efforts identified various sizes for microtransit zones ranging from the Sanford boundaries to incorporating additional communities within York County. Given the high numbers of PNS workers within Sanford, the pilot microtransit zone is the City of Sanford boundary and PNS. Successful operations could expand this microtransit boundary or lead to additional service zones.

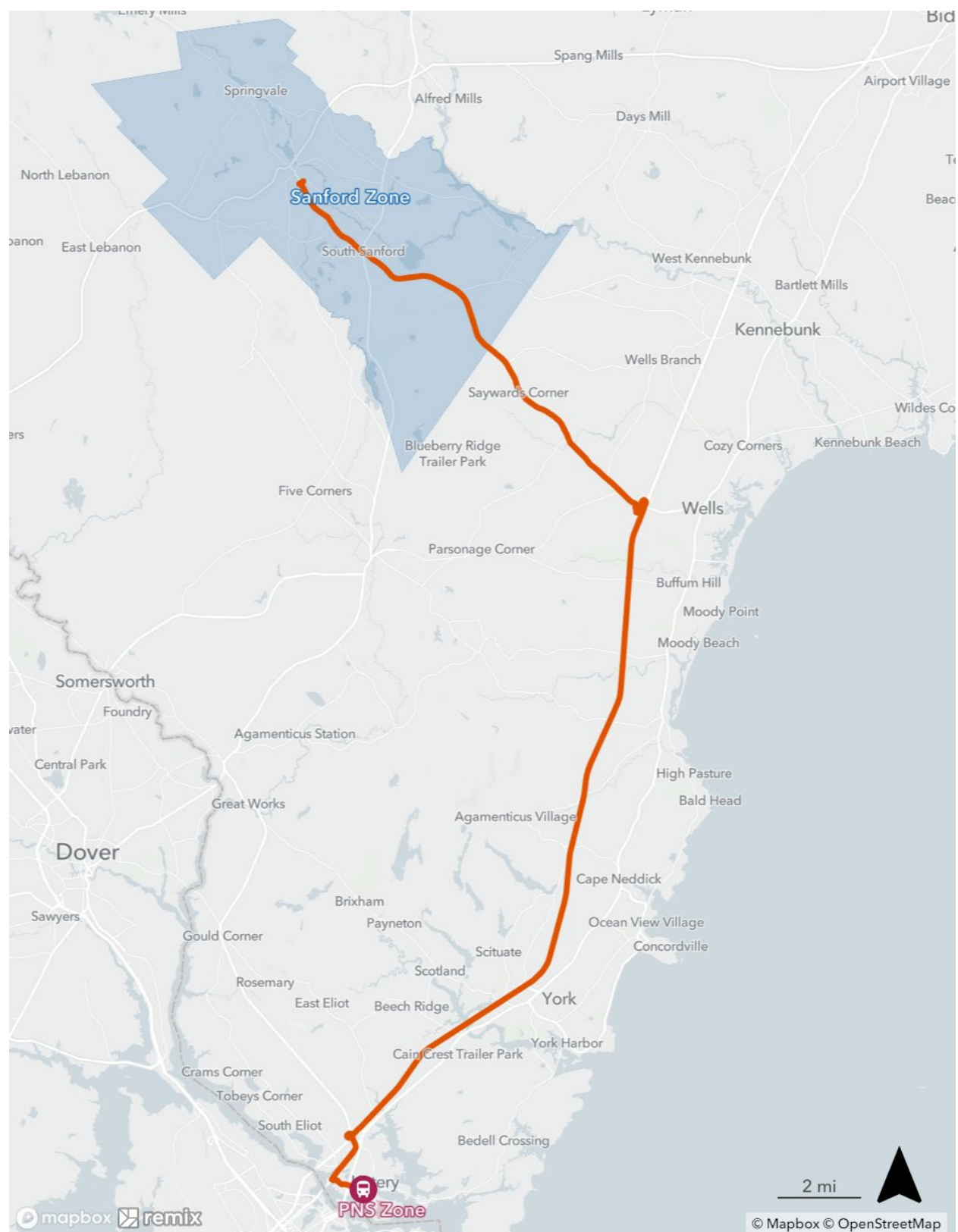
After the initial microtransit service zone was selected, three different service design types were presented to stakeholders. These service designs included a “zone-based” option, a “route-based” option, and a “hub-based” option. These options, described in detail below, present different benefits and challenges (including costs). Ultimately, a hybrid model that includes aspects of different service designs was identified through stakeholder discussion and feedback.

3.1 Zone-Based Option

The zone-based option would operate within a designated Sanford microtransit zone and connect riders to PNS. The Sanford microtransit zone is defined by Sanford’s municipal boundaries. In the morning, riders would request a ride from anywhere within the zone and be picked up either from their exact location or a virtual stop nearby and then travel on a one-seat ride to the PNS zone. In the afternoon, passengers would be able to request a drop off at virtual stops anywhere within the Sanford zone. Figure 3-1 maps the proposed service option where the Sanford zone is represented in light blue and Figure 3-2 shows the PNS zone in red. The orange route represents the route microtransit vehicles would travel to connect the Sanford zone with the PNS zone.

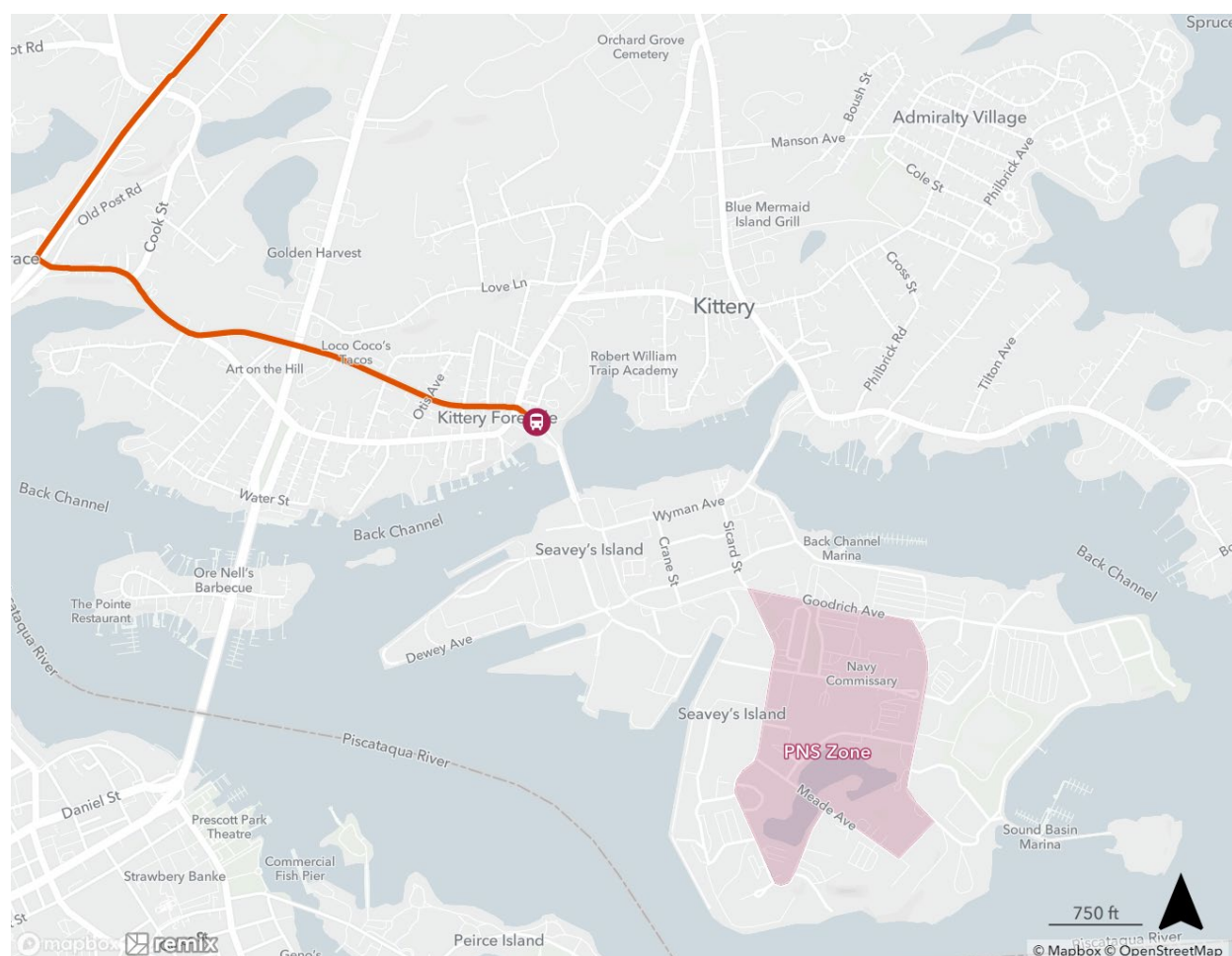
The zone-based option would offer near door-to-door service for PNS workers and Sanford residents and offer the greatest flexibility. This option would also be able to serve local residents and other markets beyond PNS commuters from Sanford. However, this option may present significant operating and cost challenges as many vehicles would be required to provide door-to-door service between Sanford and PNS given that they are 32 miles (and a 43 minute drive) apart.

Figure 3-1: Zone-Based Option



Source: Remix, AECOM

Figure 3-2: PNS Zone



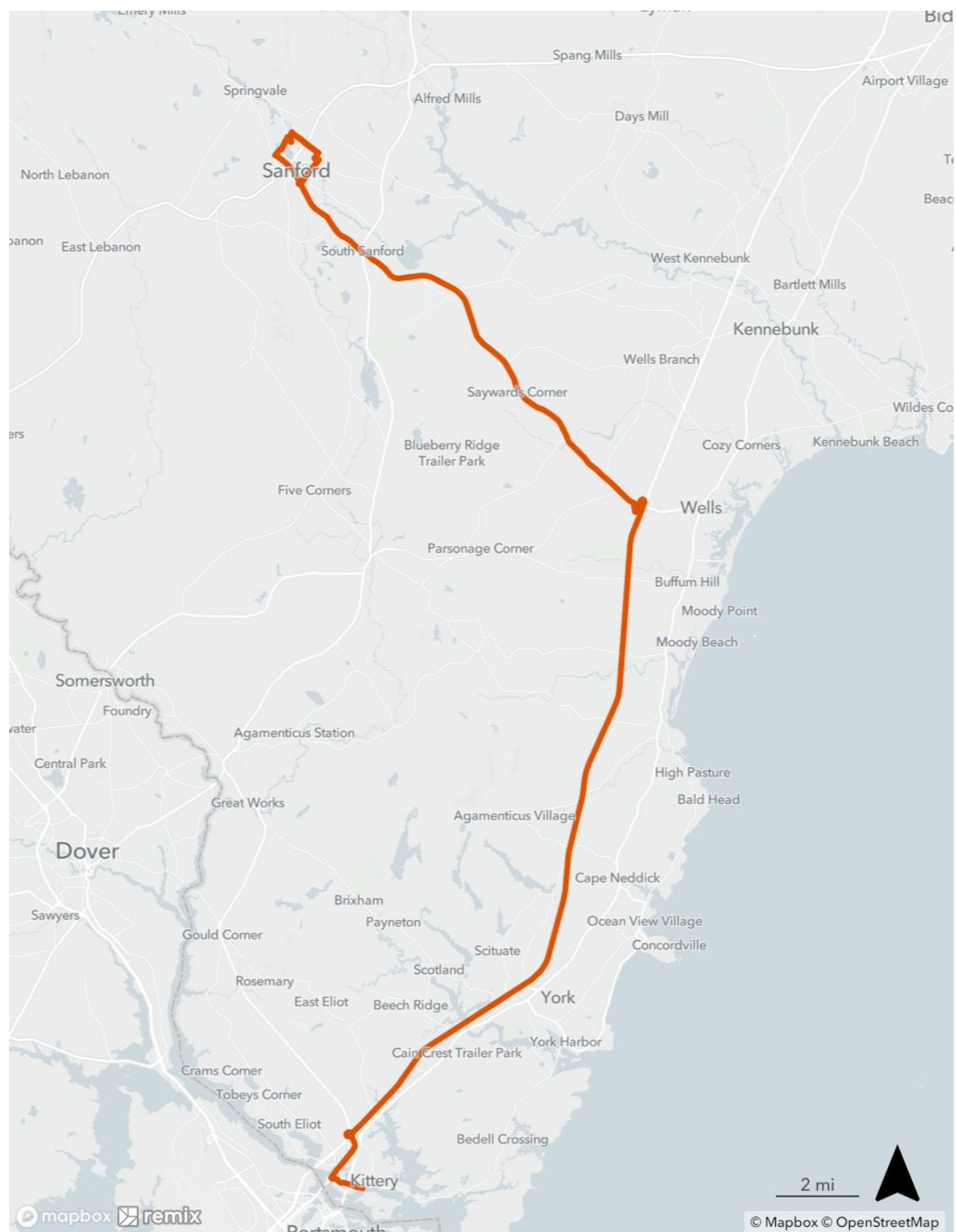
Source: Remix, AECOM

3.2 Route-Based Option

The route-based option would operate as a limited stop regular fixed-route service. Initial stops were placed within the City of Sanford designed for local residents to either walk, drive, or bike to access the route. The proposed route would also have stops along the route to PNS at MaineDOT park and ride locations in Wells, York, and Kittery. This route is shown below in Figure 3-3. Potential stops both at the PNS Gate 1 and stops on the Shipyard were also proposed in this service option (Figure 3-4).

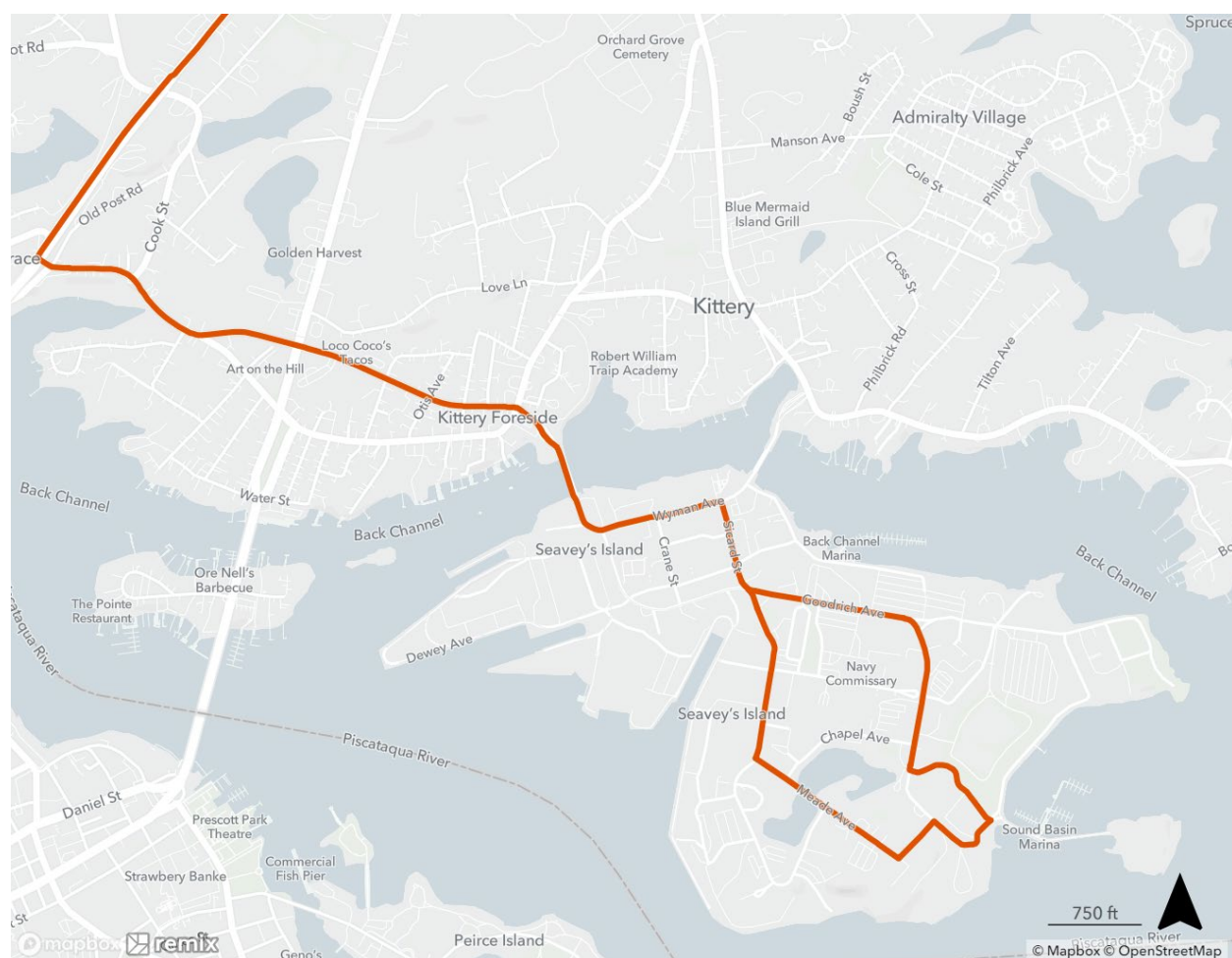
The route-based option would offer predictable scheduled service, which may be attractive to commuters. This option would also be more efficient than the zone-based option, however it would not offer the same level of flexibility for PNS workers. Additionally, riders would be responsible for accessing stops either by walking or driving to the designated stops.

Figure 3-3: Route-Based Option



Source: Remix, AECOM

Figure 3-4: Route-Based Option – Routing at PNS



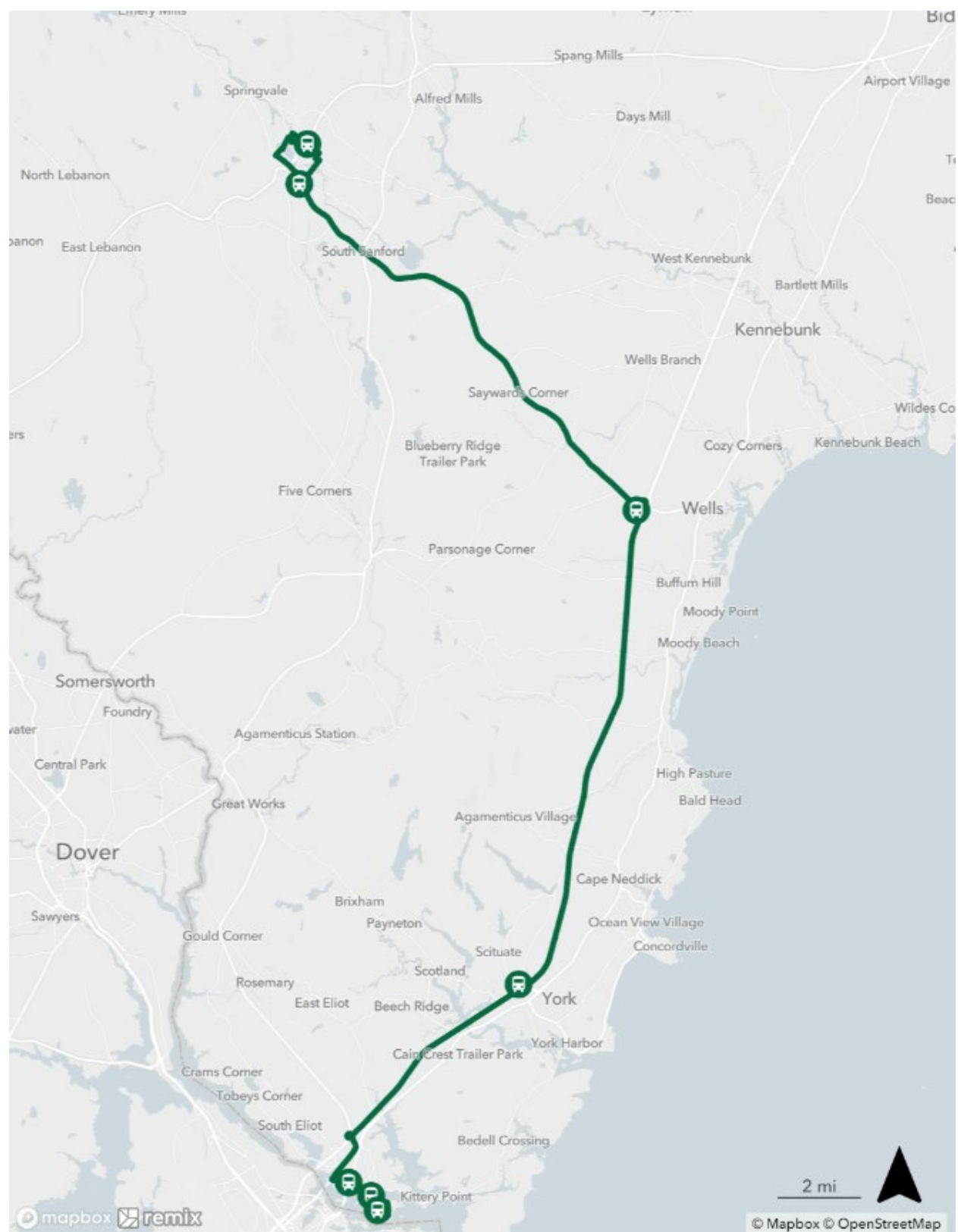
Source: Remix, AECOM

3.3 Hub-Based Option

The hub-based option would connect mobility hub locations (park and rides) with regularly scheduled transit service. Between one and three hubs would be located within Sanford, strategically positioned to capture dispersed PNS workers in the Sanford area. The transit vehicle would make scheduled stops between the Sanford hubs before traveling to hub locations in Wells and Kittery. The overall route is shown in Figure 3-5. PNS would contain the end of line hub (Figure 3-6).

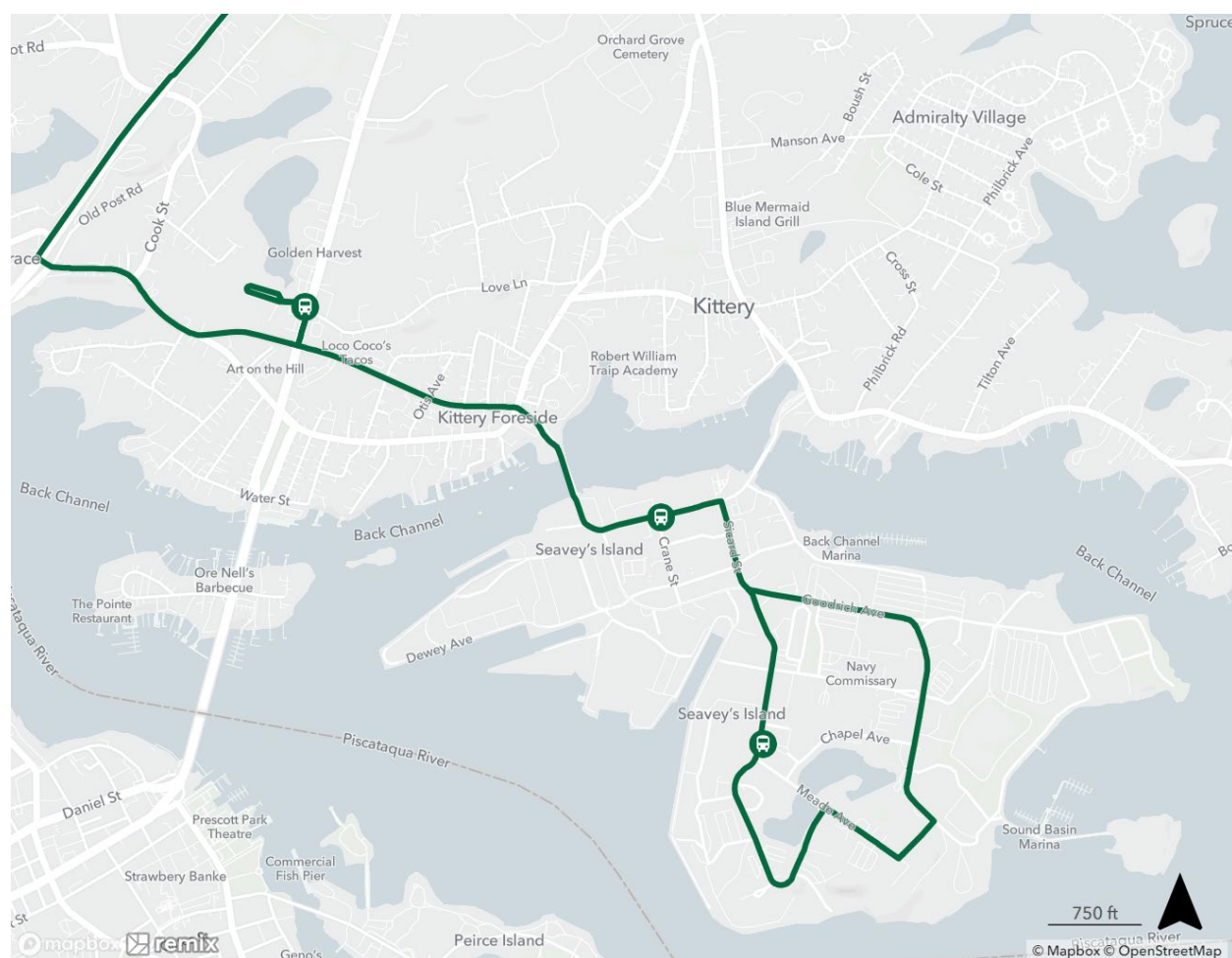
The hub-based option would likely provide the shortest in-vehicle time and would likely present the least capital and operating cost requirements. As in the case of the route-based option, this option is less flexible when compared to the zone-based option and riders would be responsible for arranging transportation to access the mobility hub locations.

Figure 3-5: Hub-Based Option - Route



Source: Remix, AECOM

Figure 3-6: PNS Hub Option – PNS Routing



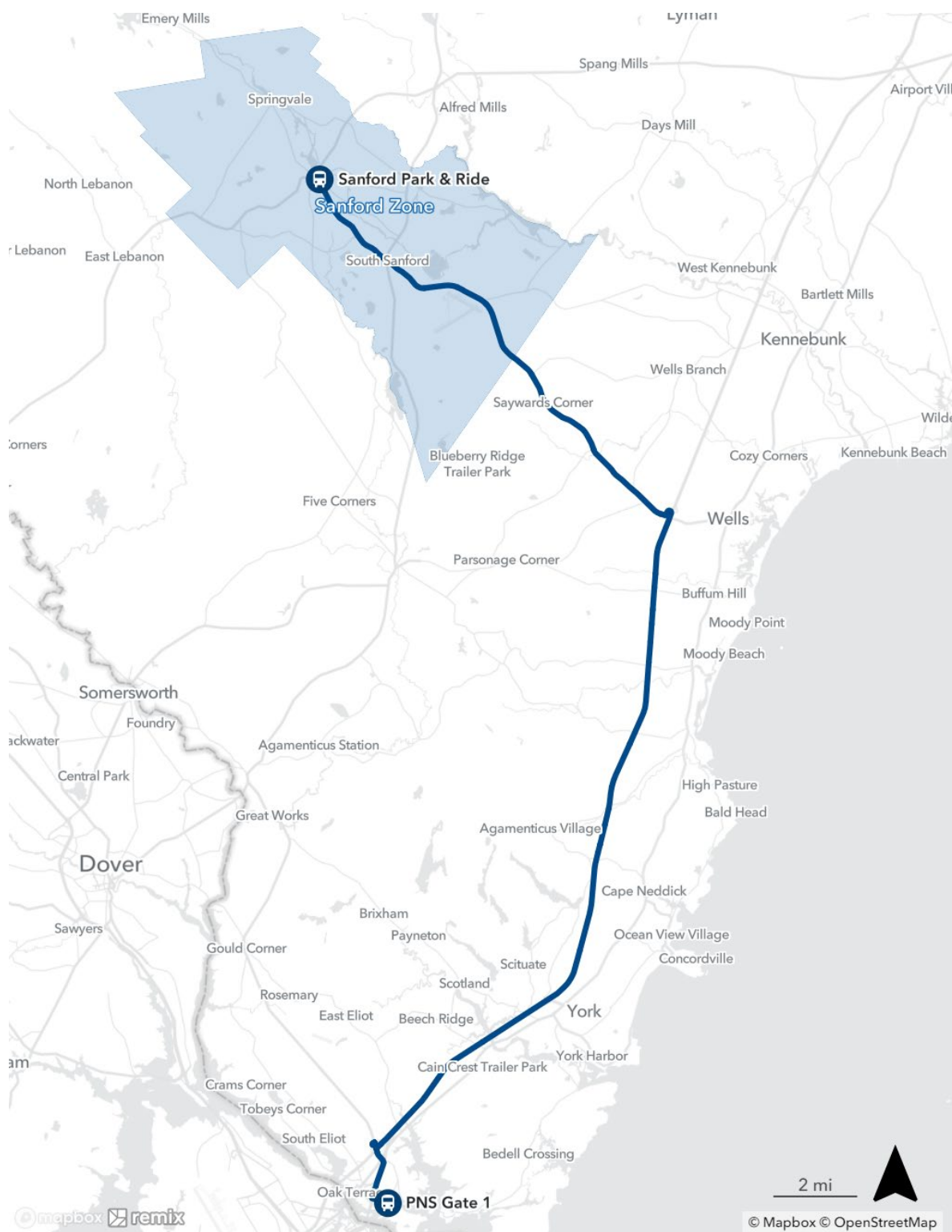
Source: Remix, AECOM

3.4 Hybrid Option (Selected Alternative)

A hybrid option that combines the flexibility of the microtransit zones with the express service and efficiency of the hub-based option was developed in response to feedback received from the Microtransit Subcommittee stakeholder group and was selected to advance (Figure 3-7). The hybrid option would include a microtransit zone within the City of Sanford as well as a mobility hub park and ride location at YCCAC's School Street Lot for riders who do not need or desire to be picked up at virtual stops near their residence. The hub also provides an opportunity for PNS workers who live outside of the microtransit zone to utilize the service. From downtown Sanford, vehicles would travel directly to PNS on an express route.

Initially, pickups along the route were considered in Wells, York, and Kittery; however, the added time needed to make these stops made this service option significantly less competitive with private automobiles from a travel time perspective and necessitated an even earlier service start. Additionally, after discussions with COAST and PNS representatives, the decision was made to drop off passengers in front of Gate 1 rather than driving vehicles onto the shipyard. Dropping passengers at the gate allows them to enter PNS more quickly, utilizing the pedestrian turnstiles instead of waiting in the vehicle queue. It also avoids security, scheduling, and reliability challenges that microtransit vehicles would likely experience from congestion inside PNS. In this scenario, workers would walk through the turnstiles and the existing on-island parking shuttle would be timed to provide workers the option of getting a ride to their worksite.

Figure 3-7: Hybrid Option (Selected Alternative)- Route



Source: Remix, AECOM

3.5 Mobility Hub Design

Mobility hubs could play an important role in offering expanded transportation options in the region. In response to several factors such as proximity to major roadways and key destinations, possible hub locations that could serve PNS workers were examined. Mobility hubs integrate multiple modes of transportation at one designated location and maximize first/last-mile connectivity. At mobility hubs, people are able to relatively seamlessly transition from one mode to another. Mobility hubs typically offer amenities such as shelters, information kiosks, wayfinding and lighting, parking and electric vehicle charging infrastructure (Figure 3-8).

As part of this Phase III JLUS Implementation work, two Kittery mobility hubs were identified for concept site plans through discussions with SMPDC, the Town of Kittery, and other stakeholders. Figure 3-9 shows a potential future Kittery Premium Outlets site and Figure 3-10 shows another potential site located at 1 Route 236. The Kittery Premium Outlets site currently serves as a MaineDOT park and ride facility. The 1 Route 236 site currently contains a small commercial building and parking lot. In conversations with the Town, the property owners indicated their potential interest in supporting a mobility hub on-site.

Residents in Sanford, Kittery, and surrounding communities would be able to park at these mobility hubs, and then take a [future potential] transit service to the Shipyard (or other locations). This could be future additional microtransit services, regular fixed-route service, or shuttles. The Kittery Premium Outlets hub location has pedestrian access currently and there are plans for bicycle facilities through the Route 1 Corridor Study currently underway. The 1 Route 236 site is off an on-ramp, however, so is limited to motorized vehicle access.

These mobility hubs would contain amenities such as seating, shelters, secure bike parking, and potentially electric vehicle (EV) charging. Table 3-1 contains cost range estimates for these amenities.

Table 3-1. Mobility Hub Amenity Cost Range Estimates

Amenity	Cost Range
Secured bike parking	\$7,000-\$14,000
Bench	\$800-\$1,500
Bus shelter	\$10,000 +
Third-party maintained EV charger	\$6,000-\$80,000
Wayfinding signage	\$1,500-\$3,000
Total	\$25,300-\$108,500

Source: Cost estimates were derived from multiple sources for each amenity from online research (September 2023).

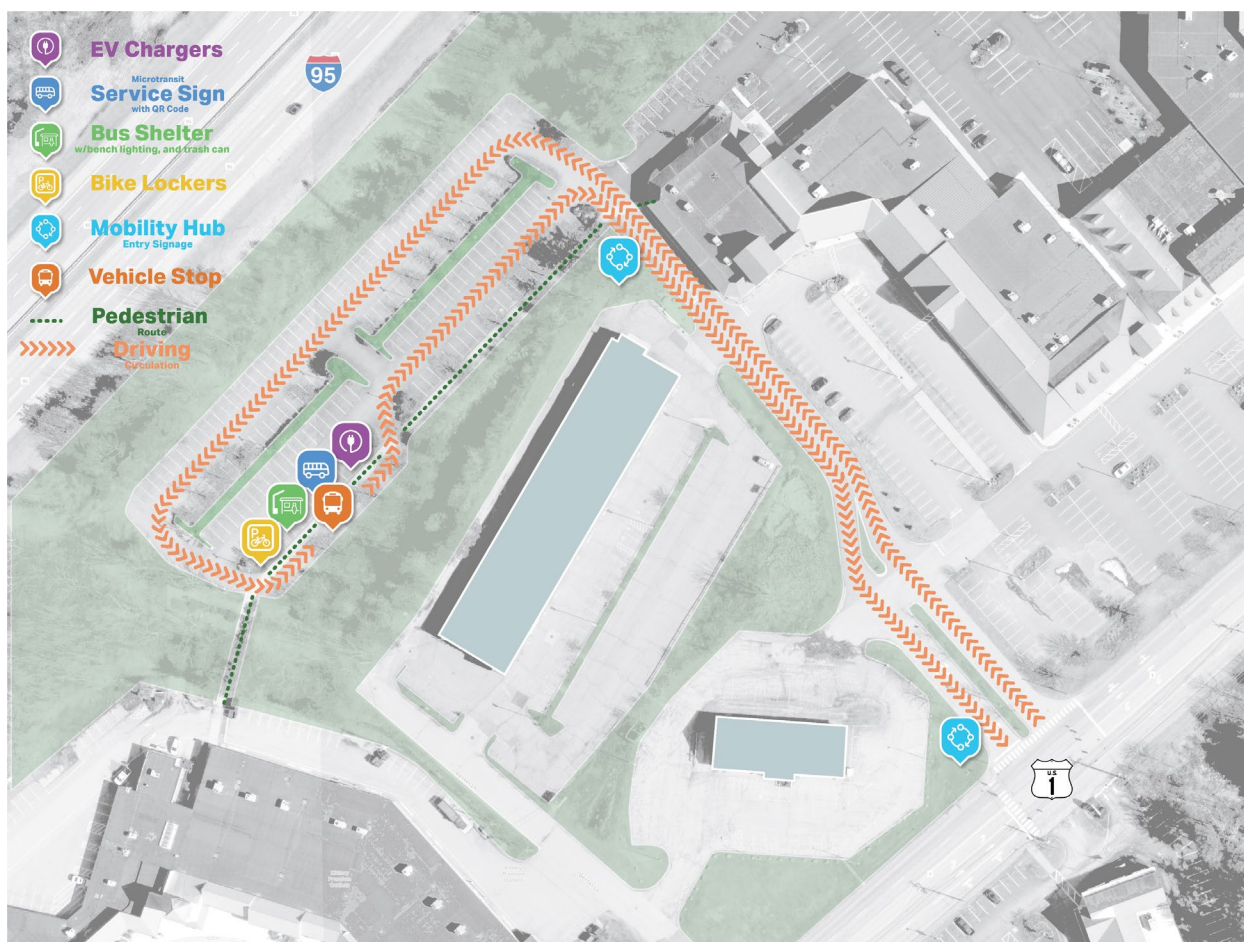
Note: The secured bike parking cost range reflects space to park 4-8 bikes. The EV charger cost range reflects the difference between level 2 and level 3 chargers, with a minimum of two (2) level 2 chargers. Wayfinding signage range reflects 1-2 signs at different sizes.

Figure 3-8: Mobility Hub Design



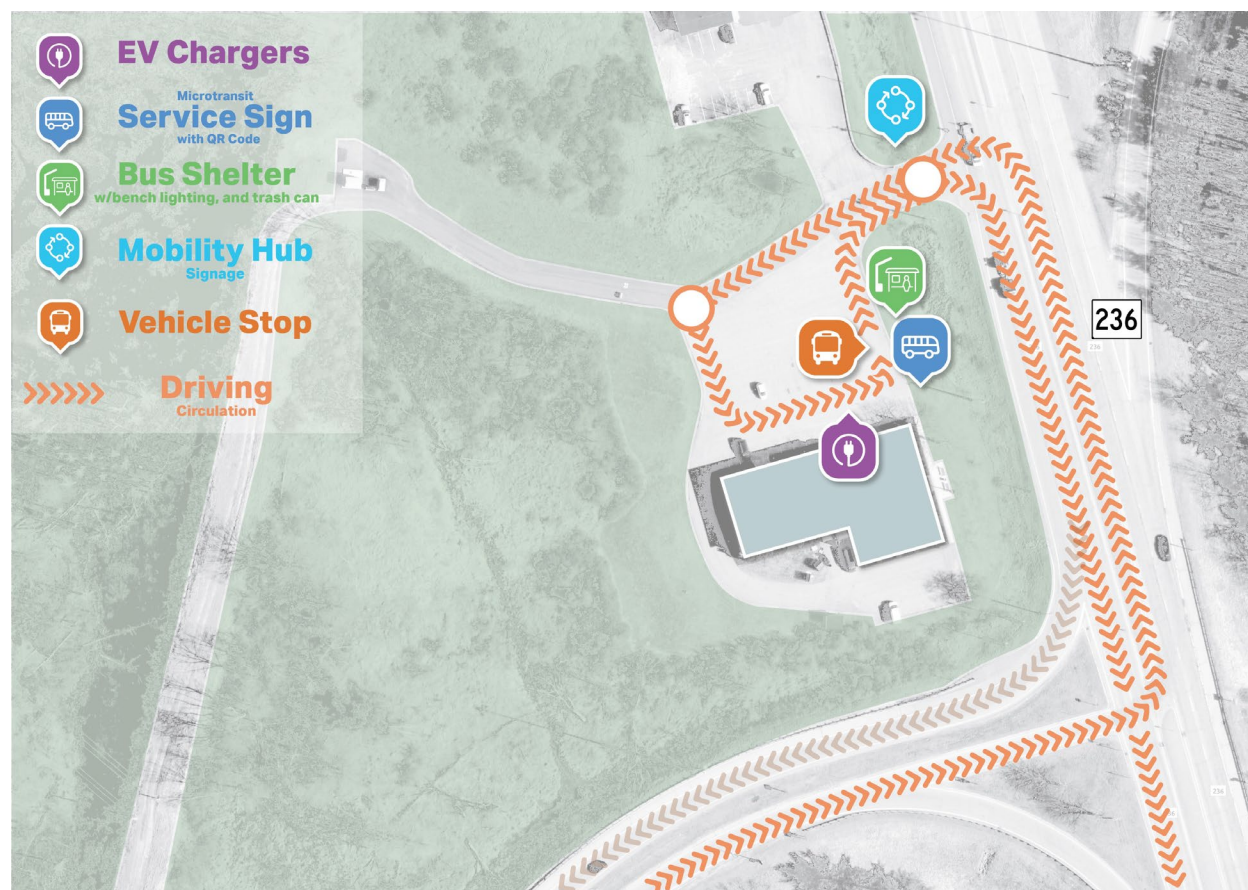
Source: City of Los Angeles "Mobility Hubs: A Readers' Guide"

Figure 3-9: Kittery Premium Outlets Mobility Hub Concept Site Plan



Source: AECOM

Figure 3-10: 1 Route 236 Mobility Hub Concept Site Plan



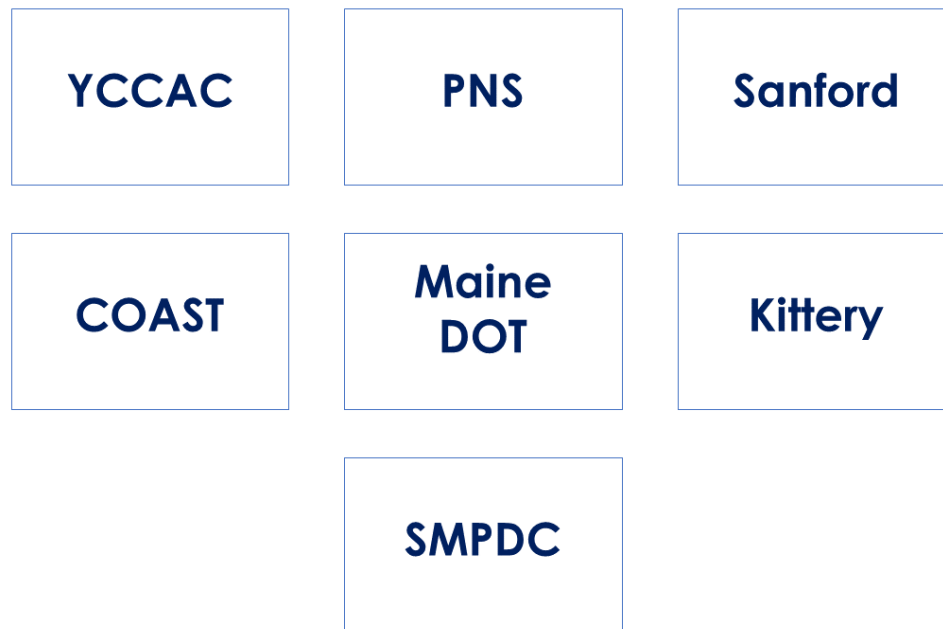
Source: AECOM

3.6 Stakeholder Involvement

Relevant stakeholders have been continually engaged throughout the pilot to provide feedback. The Microtransit Subcommittee included representatives from YCCAC, COAST, the City of Sanford, the Town of Kittery, MaineDOT, SMPDC, and PNS. This subcommittee convened three times to discuss the goals and vision of the pilot, priorities and tradeoffs, anticipated challenges, and to discuss recommendations. These stakeholders shared both their technical knowledge and experience as well as vital local knowledge and feedback, such as a routing adjustment to avoid a congested roundabout.

A Partnership Committee was also created to facilitate coordination between the transportation and housing and land use aspects of the JLUS implementation efforts. This committee (Figure 3-11) contained many of the same representatives as the Microtransit Subcommittee such as YCCAC, the City of Sanford, and SMPDC.

Figure 3-11: Partnership Committee Members



Source: AECOM

The first Microtransit Subcommittee meeting was held in December 2022. Stakeholders reviewed their roles on the project and the transportation challenges underlying the pilot development. Subcommittee members were shown the JLUS Implementation Plan’s potential microtransit zones and asked key questions that would shape the service design:

- What should the initial microtransit service zone be?
- During which times should the service operate?
- What is a reasonable target wait time for the service?
- What vehicles and staff are required to operate the service?

In response to these questions, stakeholders indicated a preference for an initial smaller zone that only encompassed the City of Sanford and the PNS campus to balance vehicle demands with competitive wait times. A target wait time of approximately 15 minutes was agreed upon, designed to serve popular weekday PNS shifts. YCCAC indicated that the agency likely had a small number of vehicles available for service implementation but would need to procure additional vehicles.

The second Microtransit Subcommittee took place in February 2023. In between the first and second stakeholder meetings, the Project Team developed preliminary service options to solicit feedback on. The Subcommittee discussed details such as specific routing along Sanford Road, I-95 vs US Route 1, and ways to avoid the congested roundabout intersection. The initial routes identified preliminary drop off and pick up points. The project team discussed the feasibility, benefits, and challenges of microtransit vehicles entering PNS through Gate 1. The three service options- zone-based, route-based, and hub-based (described in greater detail in an earlier section) were presented for discussion.

As discussed previously, the route-based option was not preferred by stakeholders as participants expressed concern that running regular fixed-route service would generate low ridership and would be less efficient than the other service options presented. Subcommittee members expressed interest in both the zone-based option and the hub-based option as park and ride facilities and (near) door-to-door service were both attractive features for a transit solution that would be competitive with driving. Table 3-2 summarizes the existing transportation challenges at PNS and the anticipated solutions from the proposed service design.

Table 3-2: Summary of Existing Transportation Challenges and Solutions

Existing Challenge	Solution from Proposed Service Design
Parking	<ul style="list-style-type: none"> ▪ Reducing congestion and need for parking
Restricted access	<ul style="list-style-type: none"> ▪ Quicker processing at the Gate using pedestrian entrance
Low density development	<ul style="list-style-type: none"> ▪ Mobility hubs and door-to-door pickup
Long commute distances	<ul style="list-style-type: none"> ▪ Express service to PNS ▪ Save money and wear and tear on personal vehicles
Convenience and flexibility	<ul style="list-style-type: none"> ▪ Multiple trips per day ▪ Workers do not need to park

The third Subcommittee meeting took place in May 2023. The proposed service design reflected feedback from prior meetings, taking aspects of the three scenarios stakeholders found appealing and combining them into one hybrid service. This proposed design combined microtransit service zones with express service to PNS Gate 1 with an option to add future mobility hubs once constructed. This meeting also included the sample timetables featured in the following chapter. Estimated costs for operations and capital investments were presented for discussion as were estimated vehicle requirements.

Following the final stakeholder Subcommittee meeting, YCCAC began discussions with the naval shipyard in Puget Sound, Washington to discuss their current transit service and worker-driver program. Puget Sound Naval Shipyard partners with Kitsap Transit to maintain a worker-driver program as a transit solution for local shipyard workers. In this program, Puget Sound workers are employed in a part-time capacity by the transit agency to operate transit vehicles on routes to pick up and drop off workers. While SMPDC, YCCAC, and PNS intend to pursue the selected hybrid service model, the worker-driver program will continue to be explored to determine its applicability to YCCAC and PNS.

4. Operating Plan and Requirements

This chapter outlines the pilot design operating plan and requirements. The service design described below reflects several rounds of refinement and feedback from the stakeholders involved throughout the planning process. Service implementation will also require capital and software investments as well as other key considerations such as equity, accessibility, and fares.

4.1 Service Design

The proposed service design combines the efficiency of fixed-route commuter service with the flexibility of traditional microtransit service. Vehicles would begin service in the morning with a microtransit service window before stopping at the downtown Sanford park and ride to pick up additional passengers. The same vehicle would then act as an express bus to the PNS Gate 1 drop off location. This design will help to alleviate long queue lines (Figure 4-1) on the Shipyard as 2,000 workers prepare to begin their 6:30 AM shifts.

The afternoon service would operate in reverse with riders boarding at the Gate 1 stop with express service to the Sanford park and ride. Passengers who walk, drove, or biked to the park and ride location would alight the vehicle and use their chosen second mode to complete their trip. Remaining passengers would then be dropped off at their booked virtual drop off locations.

Figure 4-1: PNS Commuters Queuing in Rush Hour



Source: Portsmouth Naval Shipyard

A potential service schedule for this design is presented in Table 4-1. Hourly service would begin prior to 4:00 AM to allow for sufficient time to reach PNS prior to the popular 6:00 AM shift start time. This target arrival time takes into consideration dwell time at the two stops as well as the walking time necessary for workers to reach their specific shift locations on the Shipyard from Gate 1. This service option would likely require three vehicles to complete service. The first vehicle's trip will conclude at 6:10 AM, which allows sufficient time for the vehicle to complete the final trip beginning at 6:50 AM.

Table 4-1: Weekday AM Hourly Service

Vehicle	Start Microtransit Service	Sanford Mobility Hub	PNS Gate1	Arrive Sanford Mobility Hub
1	3:50 AM	4:20 AM	5:15 AM	6:10 AM
2	4:50 AM	5:20 AM	6:15 AM	7:10 AM
3	5:50 AM	6:20 AM	7:15 AM	8:10 AM
1	6:50 AM	7:20 AM	8:15 AM	9:10 AM

In both the hourly and 30-minute service models (Table 4-2), microtransit pick up service is offered during a 30 minute service window. During this time, vehicles will pick up passengers at virtual stops throughout the Sanford zone. The microtransit software will be required to assign any pickup requests after 15 minutes prior to departure from the Sanford mobility hub (shown in the third column) to the next vehicle's trip. For example, a passenger requesting a 4:10 AM pick up would likely not be able to be assigned to the first vehicle's trip which departs at 4:20 AM to ensure on time departure and arrival at PNS. Instead, they would be assigned to vehicle 2. This means that the last trip would only have an effective microtransit service window of 15 minutes.

Table 4-2: Weekday AM 30-Minute Service

Vehicle	Start Microtransit Service	Sanford Mobility Hub	PNS Gate1	Arrive Sanford Mobility Hub
1	3:50 AM	4:20 AM	5:15 AM	6:10 AM
2	4:20 AM	4:50 AM	5:45 AM	6:40 AM
3	4:50 AM	5:20 AM	6:15 AM	7:10 AM
4	5:20 AM	5:50 AM	6:45 AM	7:40 AM
5	5:50 AM	6:20 AM	7:15 AM	8:10 AM
1	6:20 AM	6:50 AM	7:45 AM	8:40 AM

The 30-minute service shown above in Table 4-2 requires more vehicles and offers more choices for arrival times for PNS workers. As is the case for hourly service, microtransit vehicles will pick up passengers during a set 30-minute window before proceeding to the Sanford mobility hub and then to PNS Gate 1 at established timepoints.

These sample weekday timetables include a column for vehicles returning to Sanford to resume picking up PNS workers. In the event that the pilot is able to implement a PNS worker-driver program, vehicles would not need to return to Sanford for use/storage during midday. Rather, parking would be designated on PNS for vehicle storage until afternoon service begins. If the worker-driver program is not implemented, YCCAC will likely need to reorder their current shift structures to accommodate early start times.

Hourly afternoon service is shown in Table 4-3. Afternoon service is generally the inverse of the morning service schedule. Vehicles will depart Sanford or wherever vehicles are stored during the day to serve the first PNS departure at 2:15 PM. While 3:00 PM is the most common shift ending time, beginning service earlier will allow workers who need to leave early (appointments, childcare, etc.) the ability to use the transit service. From the PNS gate, vehicles will travel to the Sanford mobility hub and allow passengers to alight. From the mobility hub, vehicles will complete the remaining passenger drop offs. Vehicle 1 would be able to complete both the first run and the final run, reducing the vehicle requirements for afternoon service from four to three vehicles.

Table 4-3: Weekday PM Hourly Service

Vehicle	Sanford	PNS Gate 1	Sanford Mobility Hub	End Microtransit Service
1	1:20 PM	2:15 PM	3:15 PM	3:45 PM
2	2:20 PM	3:15 PM	4:15 PM	4:45 PM
3	3:20 PM	4:15 PM	5:15 PM	5:45 PM
1	4:20 PM	5:15 PM	6:15 PM	6:45 PM

Table 4-4 represents weekday afternoon 30-minute service. As in the case of hourly service, vehicles leave Sanford or wherever vehicles are stored for PNS to begin afternoon pickups at Gate 1. From Gate 1, vehicles travel to the Sanford mobility hub where passengers can alight and complete their journeys. The remaining passengers are then dropped off at their scheduled drop off points until the vehicle completes its microtransit service. Five vehicles would be needed to operate the 30-minute service with vehicle 1 operating the first and final runs.

Table 4-4: Weekday PM 30-Minute Service

Vehicle	Sanford	PNS Gate 1	Sanford Mobility Hub	End Microtransit Service
1	1:20 PM	2:15 PM	3:15 PM	3:45 PM
2	1:50 PM	2:45 PM	3:45 PM	4:15 PM
3	2:20 PM	3:15 PM	4:15 PM	4:45 PM
4	2:50 PM	3:45 PM	4:45 PM	5:15 PM
5	3:20 PM	4:15 PM	5:15 PM	5:45 PM
1	3:50 PM	4:45 PM	5:45 PM	6:15 PM

4.2 Potential Worker-Driver Program

Puget Sound Naval Shipyard has been employing a worker-driver program successfully for 60 years. Under this program, existing Puget Sound Naval Shipyard workers are employed on a part-time basis by the local transit agency to drive transit vehicles to the shipyard. At the time of this report, YCCAC and SMPDC were engaging representatives from Puget Sound and Kitsap Transit to discuss the details of this program and were exploring its application to the PNS service design. Current shift times for YCCAC operators begin at approximately 5:15 AM with initial pickups beginning at 6:00 AM. Implementation of a worker-driver program would alleviate YCCAC's burden to adjust operator shift schedules to accommodate the pilot microtransit service beginning prior to 4:00 AM. Implementation of this worker-driver program would require some typical driver training for PNS workers employed by YCCAC. Driver shifts can be flexible under this program. To minimize a long working duration, different PNS workers could drive in the morning and afternoon.

4.3 Capital Requirements

Implementation of new transit service requires capital investment as well as additional operating sources. Microtransit service will require selection of either a SaaS or TaaS vendor which comes with a one-time setup/installation fee as well as ongoing licensing and maintenance fees. New service will require additional vehicles with onboard technology such as tablets and mobile data. Other expenses related to vehicles include painting and signage. To inform potential riders about the new service, agencies often invest in education and promotion, logo design, web content, and print communication such as postcard flyers. An additional consideration for YCCAC is the possibility of investing in mobile ID scanners so that drivers are able to verify PNS worker ID badges. This could further improve travel times and efficiency and would require authorization from PNS.

Capital and operating requirements were estimated for both hourly and 30-minute service based on several resources:

- Hourly operating costs from YCCAC

- Peer system averages for operations and capital items
- Cost estimates from a public relations firm specializing in transit system branding
- Vehicle requirements from the service models
- Inflation rates from the US Bureau of Labor Statistics Consumer Price Index Summary

4.4 Software Requirements

Microtransit software will be required that is specifically designed to plan routes between scheduled passenger pickups and drop offs, using algorithms to optimize vehicle routing to execute trips efficiently. This software will include a platform for passengers to book rides, preferably both via a mobile app and on a desktop webpage. In addition, the software must include the necessary tools and functions for YCCAC staff to dispatch and monitor vehicles, communicate with drivers, and manually adjust trip manifests as necessary. Furthermore, it must include a driver-facing application that can be run on the vehicle tablet. The software must be able to handle circumstances where mobile data is unavailable for periods of time.

This software should also include features for setting custom service windows to fulfill the service design requirements such as not assigning a pickup later than 15 minutes prior to the vehicle with an imminent Sanford hub departure. Similarly, the software should allow for the ability to prebook trips up to 24 hours in advance. This prebooking feature, combined with the ability to book trips same day, will provide the reassurance that transportation to work is secure and flexible for PNS workers. In this vein, built-in automated alerts pushed via text or appearing in the mobile booking app are highly desirable. These alerts will inform riders of delays, particularly in the event of mechanical breakdowns, congestion, or extreme weather. Software that allows riders to create a profile that includes their regular shift times could also be a helpful feature as the routing and vehicle assigning feature could prioritize pickups by shift times.

Additionally, the software should include fare collection capabilities. Fare collection is an important piece of the pilot's operating requirements. As previously noted, TIP participants receive funds in the form of Visa debit cards. As a result, any fare collection system must be able to accept Visa card payments. Finally, the software should have reporting capabilities to comply with TIP and National Transit Database (NTD) requirements. Data such as ridership and trip miles are required by both the US Navy and the Federal Transit Administration (FTA).

4.5 Equity and Accessibility

Many people use smartphones regularly and a mobile booking app should be a key feature of microtransit implementation. However, smartphone ownership is not universal and some community members will require additional ways to book trips. YCCAC could allow these residents the ability to book rides over the phone by calling into the agency's call center and speaking with a representative. Additionally, some households are unbanked meaning that they rely on using cash to make transactions. As future phases may expand to include more members of the general public in addition to PNS workers, these access challenges should be considered. For example, the service may be configured to accept cash payment.

If using federal funds, YCCAC would be required to provide accessible service, including access to wheelchairs. If vehicles are not ADA compliant, the agencies or operators must provide equivalent service, including transportation of wheelchairs, and provide accommodations to people with disabilities. Among the requirements, agencies and operators would not charge more for a similar trip and individuals with disabilities requesting service should not have longer wait times. It is important to note that all modes of transportation are covered by DOT ADA regulations and that the transit provider is responsible for compliance with ADA regulations, independently of service being contracted out.

YCCAC may consider developing an Equity and Accessibility Plan (EAP) as the FTA encourages microtransit grant recipients to support the programs' equity goals. An EAP will assess how a transit service provides transportation-challenged riders with greater mobility in an equitable, accessible, and equivalent way.

4.6 Fare Considerations

This pilot should be optimized for reimbursement through the TIP program, which reimburses naval workers for commuting costs when they use mass transit alternatives. This program has capped reimbursement, thus fares should meet but not exceed these reimbursement funds. Existing vanpools charge up to this reimbursement ceiling. Transit fares at or below these costs will then be cost-competitive. However, fares must also be balanced against agency operating costs to ensure sustainable and ongoing service.

5. Financial Plan

This chapter includes detailed cost estimates for both operating and capital costs for two frequencies of the proposed service. Potential funding sources and the TIP are also discussed in this section.

5.1 Estimated Operating Costs

Estimated operating costs were calculated using the number of daily operating hours, annual operating days, and agency hourly operating cost (approximately \$112 per hour). Other variables include the 30-minute microtransit service window, a 50 minute trip time from downtown Sanford to PNS Gate 1, and a 2 minute dwell time.

Table 5-1 shows estimated operating costs for both operating service in one direction to PNS and for round trip operation. Round trip operation assumes that vehicles return to Sanford after dropping off passengers. These costs are inclusive of both the morning and afternoon service.

Providing hourly service for 255 days annually will result in approximately 700 operating hours per vehicle or about 3,000 hours total just to serve PNS in one direction. Returning vehicles to Sanford for storage or middle of the day service will result in over 4,800 annual operating hours. This results in an estimated cost range of \$333,600 to \$543,200.

Table 5-1: Hourly Service Operating Cost

Run	Annual Operating Hours	Annual Roundtrip Operating Hours	Annual Operating Cost to PNS	Annual Operating Cost Roundtrip (Sanford-PNS)
1	744	1,211	\$83,400	\$135,800
2	744	1,211	\$83,400	\$135,800
3	744	1,211	\$83,400	\$135,800
4	744	1,211	\$83,400	\$135,800
Total	2,975	4,845	\$333,600	\$543,200

Increasing service to every half hour, rather than every hour, will result in higher operating costs as the amount of annual operating hours increases. Table 5-2 breaks down costs for this option, demonstrating the difference in costs between returning vehicles to Sanford versus retaining vehicles at the Shipyard. Annual operating hours for 30-minute service assumes approximately 4,500 hours to serve PNS and storing vehicles onsite or about 7,300 hours to return vehicles to Sanford in between morning and afternoon service. This results in an estimated cost range between \$489,000 and \$814,800.

Table 5-2: 30-Minute Service Operating Cost

Run	Annual Operating Hours	Annual Roundtrip Operating Hours	Annual Operating Cost to PNS	Annual Operating Cost Roundtrip (Sanford-PNS)
1	744	1,211	\$83,400	\$135,800
2	744	1,211	\$83,400	\$135,800
3	744	1,211	\$83,400	\$135,800
4	744	1,211	\$83,400	\$135,800
5	744	1,211	\$83,400	\$135,800
6	744	1,211	\$83,400	\$135,800
Total	4,463	7,268	\$489,000	\$814,800

5.2 Estimated Capital Costs

Capital cost estimates are included in Table 5-3, below. One-time installation fees remain constant between the two proposed frequencies for service. Other costs such as education and promotion costs, logos and branding, postcards, and videos are also consistent between service frequencies. As described in the operating costs section, hourly service will require fewer vehicles and so capital costs for tablets, painting, and vehicles will vary between the two scenarios. The total estimated costs range from approximately \$94,800 to about \$126,000. The capital difference between hourly service and 30-minute service is just over \$30,000.

Table 5-3: Estimated Capital Costs

Item	Hourly Service	30 Minute Service
One-time set up/installation fee	\$28,000	\$28,000
Vehicles (VOMS)	3	5
Tablets	\$4,800	\$8,000
Vehicle Painting	\$42,000	\$70,000
Education/Promotion	\$20,000	\$20,000
Logo	\$3,600	\$3,600
Branding & Style Guide	\$2,700	\$2,700
Rider Guide	\$1,500	\$1,500
Website Content	\$1,800	\$1,800
Postcard Design	\$900	\$900
Postcard Printing	\$3,500	\$3,500
Rider Video	\$6,000	\$6,000
Total	\$94,800	\$126,000

5.3 Potential Funding Sources

Potential funding sources include competitive discretionary grants, state and federal formula funds, and fares from the TIP program. The FTA maintains discretionary grants aimed at mobility innovation as well as transit improvements for rural areas. YCCAC would likely be eligible for the FTA's 5311 Formula Grants for Rural Areas. These grants provide capital, planning, and operating assistance to support public transit in rural areas. The federal share for capital projects is 80 percent and 50 percent for operating assistance. These funds are apportioned to states using federal formulas.

The recent Bipartisan Infrastructure Law (BIL) has expanded available funding for public transit including the new Carbon Reduction Program which aims to reduce emissions from on-road highway sources. The State of Maine has received nearly \$30 million in formula funding for FY 22-FY 26 for eligible projects. Maine also maintains a Workforce Transportation Pilot program, which is a competitive grant program that supports transportation pilots across the state up to the established cap award amount of \$750,000. The particular focus of the program is to support workers' transportation from rural areas.

Funds are also available through the American Rescue Plan for transit apportioned to the State of Maine and available through competitive grant programs. Additionally, the BIL offers opportunities for funding mobility hubs. The Office of Local Defense Community Corporation maintains the Installation Resilience program that provides funding for military installations partnered with local or state agencies to support resilience. Transportation projects are considered eligible activities under this program and could be a potential funding source to pursue for future phases of the project.

Funding from the TIP program, which is designed to promote mass transit use for naval workers, would come indirectly through passenger fares. PNS workers receiving TIP funds would be able to use these funds to reimburse YCCAC for transit trips, thus contributing to the agency's operating funds.

5.4 TIP Program Eligibility

The Department of Defense (DOD) Instruction 1000.27 establishes TIP, a mass transit benefit program for workers outside the National Capital Region (Washington, D.C.). The US Department of the Navy administers an incentive program, in accordance with this DOD Instruction, to encourage Naval employees to use mass transit when commuting. All Navy and Marine Corps active duty personnel and civilian employees are eligible for the program. The program reimburses commuting costs for workers using mass transit or other rideshare methods to commute. Many PNS workers currently take advantage of TIP benefits for vanpool. After approval from the local office, TIP funds are disbursed via Visa debit cards that can be used to pay for transit passes or vanpool costs.

To receive TIP reimbursement, workers must meet the program's eligibility requirements. Trips must be made at least 50 percent (miles) via mass transit. Workers must also use mass transit 11 calendar days a month, at a minimum. Workers are also available for *either* the vanpool voucher program *or* the bus program but not both simultaneously. Participants are eligible to receive up to \$300 per month for reimbursement, though exact reimbursement caps vary by local office regulations.

6. Implementation Plan

This chapter includes details of the implementation plan for the microtransit pilot. Stakeholder roles are defined and key data points to collect and monitor are identified. This chapter also includes a discussion of performance indicators that can be used to evaluate the pilot.

6.1 Stakeholder Roles

Stakeholders have been identified and engaged throughout the service design process. As discussed in Section 3.6, local and regional planning organizations have been involved through coordinated committee meetings to provide feedback. YCCAC has been identified as the agency to operate the microtransit pilot, with support from PNS, the Town of Kittery, and SMPDC. MaineDOT has also been identified as a partner as the agency maintains regional park and ride facilities and partners with transit agencies, like YCCAC, for operating support, vehicle procurement, and asset management. State funding support for the project is also anticipated. PNS will continue to coordinate with YCCAC, Kittery, and SMPDC to ensure smooth operations of the transit service. This will include a coordinated effort to align the existing PNS shuttle (Figure 6-1) with microtransit service schedules so riders can seamlessly transition between the distinct services.

Future phases of the project could include mobility hub facilities located in the Town of Kittery. Kittery has been represented in stakeholder engagement throughout this process and is invested in developing and implementing a solution to reduce vehicle congestion and conflicts within the town resulting from PNS worker commutes. Kittery's potential future mobility hubs would complement the PNS-oriented microtransit service and facilitate service expansion to additional zones or routes. Likewise, the City of Sanford has been engaged through stakeholder groups and will continue to be involved in the construction of the downtown park and ride facility.

Figure 6-1: Shipyard Workers Queuing to Board On-Island Shuttle



Source: Portsmouth Naval Shipyard

6.2 Data Collection and Analysis

Operation and evaluation of the pilot will involve detailed data collection and analysis. This data will enable YCCAC to monitor performance indicators and to improve transit service accordingly. YCCAC should include data sharing requirements and specify the data to be provided in the contract with a microtransit software vendor. Examples of data that could be required of a microtransit vendor include:

- Rider ID
- Request origin
- Pick up and drop off date and time
- Number of riders
- Ride distance (miles)
- Ride duration (minutes)
- Fare paid
- Average wait times
- Completed rides
- Shared rides (%)
- Missed trips
- Average ride distance (miles)
- Average deadhead distance
- On-time pick up %
- Top 5 pickup and drop off request intersections
- Average vehicle downtime

The FTA has required recipients of its discretionary microtransit grants to prepare Data Management Plans (DMP) that address data stewardship, standards, storage, and access. YCCAC may consider developing a DMP as well and could utilize FTA's DMP template. The agency would then need a staff person dedicated to analyzing microtransit service data and to ensure the DMP requirements of the microtransit provider are fulfilled. DMP requirements for the provider should be included in the RFP for services so that the requirements are built into the contract.

6.3 Performance Indicators and Standards

Key performance indicators (KPI) should be developed to evaluate the efficiency and success of the microtransit service. At a minimum, these should be included in the contract with a microtransit vendor. These KPI standards will be used to guide future service expansion or changes. The standards will also be used to ensure compliance with ADA, Title VI, and other local, state, and federal requirements.

Examples of service standards to monitor effectiveness, efficiency, and productivity include:

- **Passengers per Revenue Hour:** The total number of passengers divided by the total number of revenue service hours provides a data point for monitoring ridership as it relates to total vehicle hours operated. This key productivity measurement works as an effective tool for future service planning. Improving ridership is often the goal of planning bus service; however, it is just as important to plan for additional ridership with a "right-sized" service area. Three passengers per revenue hour is considered a best practice for microtransit.
- **Operating Cost per Trip:** The total operating costs are divided by total trips to calculate the cost for each trip on the service. This is designed to track the cost effectiveness for the system as it relates to ridership over time.
- **Percent of Pooled Trips:** This includes the percent of total trips that have two or more passengers per trip. This is a key efficiency indicator showing that service is being optimized through shared rides, and potentially contributing to environmental sustainability.

Service quality standards help staff evaluate system performance pertaining to reliable and high quality service which encourages ridership. The recommended service quality performance standards include the following:

- **Percent of Trips within the Average Wait Time:** Prior to implementation of service, YCCAC will need to define the average wait time for passengers of the service. This planning effort has assumed an average wait time goal of 15 minutes. This KPI tracks the percent of trips that fall within the defined wait time.
- **Capacity Denials:** The total number of trips denied due to capacity restraints.
- **Missed Trips:** The total number of trips missed per day. This measures the overall reliability and quality of the service. A missed trip is defined as a pickup that is later than a defined time period from the planned trip pickup window. For example, some services define missed trips as trips that are later than 15 minutes past the promised pickup time.
- **Call Center Average Wait Time:** The average time a rider has to wait before being connected with a staff person to assist them with booking at trip.
- **Vehicle Average Downtime:** The average duration a vehicle is out of service due to maintenance. Vehicle downtimes should be minimized by using local maintenance providers as longer average vehicle downtimes result in needing a larger vehicle fleet size to maintain service standards.

In addition to the key indicators described above, the National Transit Database (NTD) requires that all agencies operating transit service, including microtransit, report performance data on a monthly basis. The data should be reported within 30 days after the end of each month. According to the FTA Reporting Manual, service providers should report the following operating data:

- Passenger boardings
- Vehicle revenue miles
- Vehicle revenue hours
- Vehicles operated in revenue service

6.4 Future phases

After evaluating the pilot using key performance indicators and standards, YCCAC can adjust service as needed to continue to improve the efficiency and efficacy of the service design. Implementation has been designed in a multi-phased approach, with additional phases to follow. Phase 1 includes the initial service design and Phase 2 expands service from the future Kittery Mobility Hub(s). This expansion would alleviate congestion in Kittery's Foreside and support PNS's resiliency and growth goals. Facilitating greater transportation options for workers will improve commute options for PNS workers and thus make it easier for PNS to achieve its hiring goals. This phase would also improve connections to regional transportation (such as the private C&J regional bus network). Finally, a third phase is also anticipated. Phase 3 could expand service to include Wells, Maine, thereby increasing regional connections by serving the Amtrak station. Phase 3 could also serve an off-base park and ride facility for the PNS workforce.

Each phase of transit implementation is crucial to serving the ongoing and future needs of PNS. As the shipyard expands and grows its workforce, transportation challenges from automobile travel will also increase. Limited parking will become more of an issue as more workers compete for finite space. Figure 6-2 shows the existing parking garage on the Shipyard.

The island geography places constraints on the amount of ROW possible on the campus and the necessary limited access at two gates exacerbates long queues at shift start/end times. PNS will need to leverage its current shuttle system, in coordination with YCCAC's pilot microtransit service, to mitigate these challenges. Creation of off-campus parking and shuttle services are a potential mitigation measure.

Figure 6-2: PNS Parking Garage



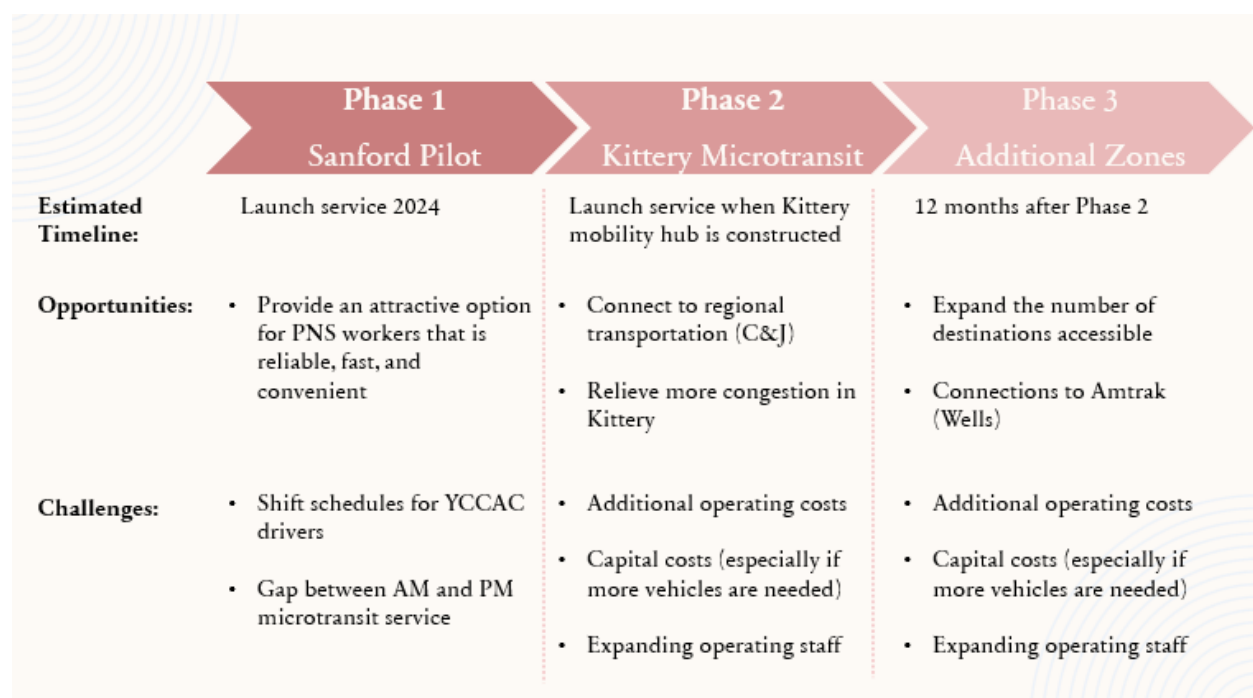
Source: Portsmouth Naval Shipyard

6.5 Implementation Timeline

A preliminary implementation timeline is featured in Figure 6-3, below. This timeline assumes a Spring 2024 initiation when vehicles and software are procured and transit service is launched. The initial pilot is identified as Phase 1 with subsequent phases (Phase 2 and Phase 3) following a successful pilot launch. The Phase 1 timeline is contingent on YCCAC procuring vans to expand its fleet and the operation of the downtown Sanford park and ride facility. The potential worker-driver program whereby existing PNS workers would be employed by YCCAC to operate transit service is also a key factor in the timeline for implementation. A worker-driver program would address the challenge of finding existing YCCAC drivers to begin significantly earlier shifts but would also require time to recruit and train PNS workers as part-time drivers.

Phase 2 will begin when the Kittery mobility hub(s) are operational. This phase will allow for increased connections to the regional C&J routes. Phase 2 will likely also require additional vehicles to expand service as well as additional operating staff and drivers. Finally, Phase 3 is expected to launch 12 months after Phase 2, further expanding the number of destinations accessible via the service. This phase will connect to the Amtrak system in Wells, Maine. As in the case of Phase 2, Phase 3 will also require greater capital and operating investment. A detailed implementation plan is provided in Appendix A and a service design troubleshoot guide in Appendix B.

Figure 6-3: Implementation Timeline



7. Conclusion

This report outlines the implementation plan for the proposed hybrid microtransit service design, including estimated costs and considerations. By collecting and evaluating data during the first phase of service, YCCAC and partners will be able to measure the success of the pilot using performance indicators included in this document. The design of this pilot allows for future phases to expand service and increase connections in the region. A potential Phase 2 of the project could include future zones in Kittery with the construction and operation of future Kittery mobility hub(s). Additional phases could build on established service and expand to create greater regional connections by serving the Amtrak station in Wells, Maine and commuter service from C&J routes. Transit expansion through Phase 1, 2, and subsequent phases will support PNS's resiliency and growth goals by increasing transportation options for commuters thereby making it easier to hire and retain staff. Additionally, providing greater transit opportunities will alleviate congestion in Kittery as well as creating connections to the regional transportation network.

These phases will require additional operating and capital costs to expand YCCAC's fleet and staff. Implementation of all phases will require and involve ongoing coordination between partners and stakeholders to deliver transit service in southern Maine. The worker-driver program successfully used by Puget Sound could be implemented for PNS workers. Exploring the logistics of implementing a similar program is the next stage of this process.

Appendix A: Implementation Plan

Detailed Implementation Plan

Planning	Contracting and System Start-Up	Implementation and Monitoring
Administration		
<ul style="list-style-type: none"> ☑ Analyze demographics and existing transit performance data ☑ Define and analyze preliminary microtransit zones ☑ Identify potential funding sources ☑ Develop an implementation plan ☑ Finalize Service Design <ul style="list-style-type: none"> ○ Zone boundaries ○ Stop type ○ Stop locations ○ Pre-scheduling trips ▪ Develop a staffing plan (org chart, positions required, job descriptions) ▪ Integrate accessibility and equity into service design ▪ Optional: Prepare a Data Management Plan (DMP) that addresses data stewardship, standards, storage, and access ▪ Optional: develop an Equity and Accessibility Plan (EAP) that includes ADA considerations <ul style="list-style-type: none"> ○ Service Equivalency for Seniors, Populations with Mobility Impairments and Other Disabilities ○ Service Equivalency for the Unphoned, Underphoned and Low Connectivity Riders ○ Service Equivalency for the Unbanked and Underbanked 	<ul style="list-style-type: none"> ▪ Procure a SaaS or TaaS vendor using RFP ▪ If applicable, receive board approval for selected vendor ▪ Develop a branding and marketing campaign that uses elements such as: <ul style="list-style-type: none"> ○ New logo ○ Vehicle wrap ○ New rider guide ○ Website content ○ Direct mail postcard ○ Promotion and education video ▪ Develop a detailed operations plan and safety plan that includes vehicle storage, maintenance, cleaning, and safety procedures. ▪ Update agency insurance policy to cover the service ▪ Train operators, maintenance, and administrative staff on key elements of the service: <ul style="list-style-type: none"> ○ Safety procedures ○ Maintenance of microtransit vehicles ○ Use of the dispatching software ○ Use of the rider-facing booking tools ○ Process for riders who cannot book rides using the smartphone application or website ○ Transfer policies from microtransit to fixed-route ○ New fare structure ▪ Launch the marketing campaign including press releases and service promotion 	<ul style="list-style-type: none"> ▪ Prepare Title VI review to ensure that the level and quality of service are provided in a non-discriminatory manner ▪ Update and establish regular procedures for maintaining system goals, objectives, and strategies. ▪ Develop method for collecting feedback from riders. Customer comments should be documented by microtransit software vendor for analysis. ▪ Prepare educational materials that PNS and other local employers can use to promote the microtransit service ▪ Assess service for potential improvements by reviewing rider and stakeholder feedback.

Joint Land Use Study Implementation

Planning	Contracting and System Start-Up	Implementation and Monitoring
Operations		
N/A	<ul style="list-style-type: none"> ▪ Procure vehicles if necessary ▪ Field test locations that may be more difficult to access or present safety concerns ▪ Modify the operations and safety plans as necessary based on field tests ▪ Test dispatching software prior to training operators, maintenance, and administrative staff ▪ Test rider-facing smartphone app and website applications prior to training drivers, maintenance, and administrative staff ▪ Confirm reports and exports are functioning correctly ▪ Brand microtransit vehicles with vehicle wrap and logo ▪ Install microtransit signs at all microtransit stops ▪ Install driver tablets onboard vehicles ▪ Launch service 	<ul style="list-style-type: none"> ▪ Adjust the microtransit service area based on demand, including updates to frequency and service hours ▪ Update service based on development of new transit generators ▪ Track operational data for performance standards ▪ Report NTD data on an annual basis
Financial		
<ul style="list-style-type: none"> ☑ Confirm eligibility of service for TIP program with local TIP office ☑ Conduct a microtransit study to estimate capital and operating costs <ul style="list-style-type: none"> ▪ Secure grant funding 	<ul style="list-style-type: none"> ▪ Coordinate funding for service ▪ Fulfill funding reporting requirements 	<ul style="list-style-type: none"> ▪ Identify additional sources of funding to sustain the microtransit service ▪ Monitor potential grant and funding opportunities ▪ Fulfill funding reporting requirements

Appendix B: Service Design Troubleshoot Guide

Challenge	Potential Solutions
Limited awareness of program	<ul style="list-style-type: none">▪ Work with PNS to advertise the service using a variety of print and digital communication methods
Long wait time for microtransit vehicle	<ul style="list-style-type: none">▪ Increase vehicle fleet▪ Increase distance riders may travel to virtual stops to increase trip pooling/efficiency
Increased capacity denials	<ul style="list-style-type: none">▪ Increase vehicle fleet▪ Increase distance riders may travel to virtual stops to increase trip pooling/efficiency
Microtransit vehicles at capacity prior to reaching downtown Sanford mobility hub	<ul style="list-style-type: none">▪ Increase vehicle fleet▪ Use vehicles with larger capacity
PNS workers miss their shift start time	<ul style="list-style-type: none">▪ Adjust timetables for an earlier departure from Sanford
Finding YCCAC drivers to operate earlier shift times	<ul style="list-style-type: none">▪ Implement a PNS worker-driver program
Microtransit vehicles affected by congestion within PNS (if using the worker-driver program)	<ul style="list-style-type: none">▪ Designate parking spaces for microtransit vehicles as close as possible to Gate 1